

Exhibit A to CardWare Inc.'s P.R. 3-1 Disclosure of Asserted Claims and Infringement Contentions
Infringement of U.S. Patent No. 10,339,520

This claim chart is based on publicly available literature. Plaintiff will be seeking internal documentation, including technical documentation such as schematics and datasheets, and source code in discovery and therefore Plaintiff reserves the right to amend or further supplement this claim chart.

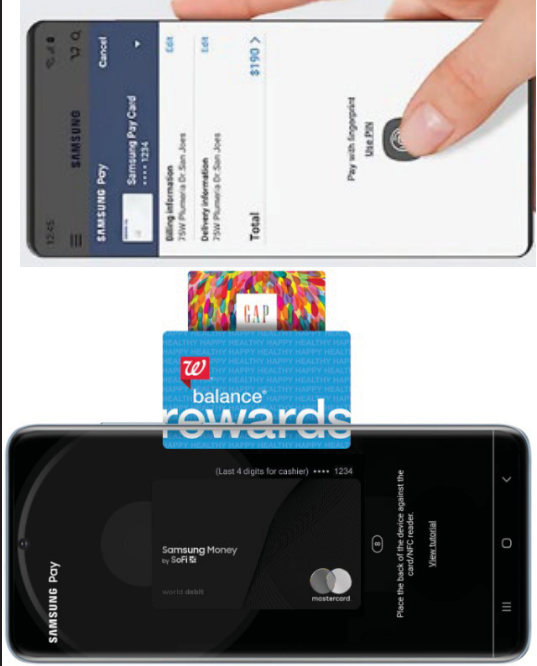
Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (“Defendants”) directly infringe U.S. Patent No. 10,339,520 (the “’520 patent”)—either literally or under the doctrine of equivalents—by making, using, selling, offering for sale, and/or importing into the United States Samsung Pay-enabled products and/or technology, including Samsung mobile phones and watches, covered by one or more claims of the ’520 patent. Unless otherwise noted, Plaintiff’s allegations include Samsung Pay and all Samsung Pay-enabled products, as well as any similar functionality, including as might be contained within Samsung Wallet (collectively, “the ’520 Accused Products”).

Defendants indirectly infringe the ’520 patent by inducing others (including customers) to infringe and/or by contributing to others’ infringement of the ’520 patent—either literally or under the doctrine of equivalents. Defendants, having actual knowledge of the ’520 patent, actively and knowingly induced and contributed to their customers’ and/or other third parties’ infringement by (1) supplying the Accused Products; (2) encouraging, aiding, or otherwise causing third parties to import, sell, offer for sale, and use the ’520 Accused Products; and (3) providing information and technical support to customers, including promotional materials, product manuals, brochures, videos, demonstrations, and website materials encouraging customers to purchase and use the Accused Products and instructing their customers on how to use the ’520 Accused Products. In addition, Defendants knowingly supply to its customer and/or other third parties the ’520 Accused Products, which products are then used in an infringing manner, and which products are not a staple article of commerce suitable for non-infringing use.

Examples of how the ’520 Accused Products infringe the asserted claims of the ’520 patent are detailed in this claim chart. To the extent any limitation is not literally present, it is present under the doctrine of equivalents. The products included in this claim chart are representative; other Accused Products function in generally the same manner as one or more of the examples provided herein, and contain generally the same components. CardWare reserves its right to amend these contentions under the procedures set forth in P.R. 3-6.

I. Claim 1 and Dependent Claims 4-9

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
1 [Pre]: An electronic device comprising	To the extent the preamble is limiting, a Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:

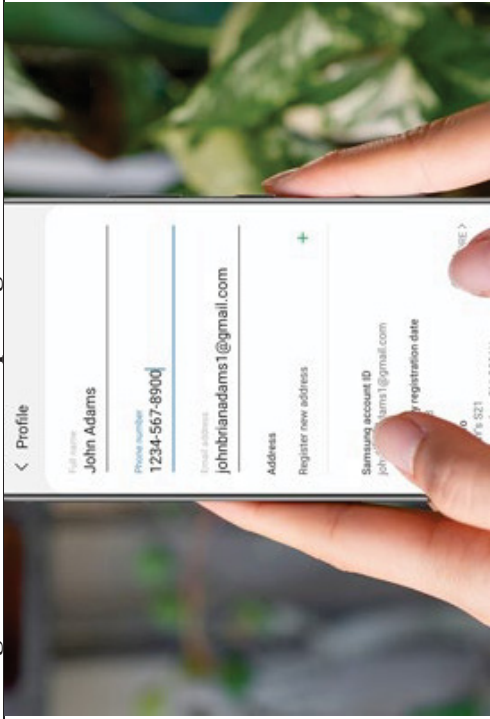
Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device  <i>Samsung Pay</i>, Samsung, https://www.samsung.com/us/samsung-pay/ (last visited Aug. 29, 2022); <i>Commonly-asked questions about Samsung Pay</i>, Samsung, https://www.samsung.com/us/support/answer/ANS00080583/ (last visited Aug. 29, 2022). <i>See also</i> Lexy Savvides, <i>Samsung Pay: Everything you need to know (FAQ)</i>, CNET (July 21, 2021 3:00 a.m. PT), https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/. Samsung Pay just got even better. Samsung Pay is now part of Samsung Wallet. Upgrade to Samsung Wallet now to get all the new features and the simplified app experience. Get Wallet  <i>Samsung Wallet</i>, Samsung, https://www.samsung.com/us/samsung-wallet/.
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Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	Before using Samsung Pay Note: Samsung Wallet is available for devices running Android 9 or higher. Here's what you'll need before you can use Samsung Pay: • A compatible Samsung phone or watch • NFC or MST support on your phone or watch • A Samsung account • A supported credit, debit, or gift card from a participating bank, credit union, or vendor • A registered fingerprint or Samsung Pay PIN • Be located in the country of the participating bank, so the bank can verify your card <i>Set up Samsung Pay on your phone or watch, Samsung,</i> <a data-bbox="526 407 558 1518" href="https://www.samsung.com/us/support/answer/ANS00045081/">https://www.samsung.com/us/support/answer/ANS00045081/ (last visited Aug. 28, 2022).
I[a]: a near-field communication (NFC) unit;	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Samsung Pay is available on all Samsung computing devices. See Lexy Savvides, Samsung Pay: Everything you need to know (FAQ), CNET (Jun. 22, 2019), <a data-bbox="706 159 738 1518" href="https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/">https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/; How to use Samsung Pay, Chase, <a data-bbox="738 201 771 1518" href="https://www.chase.com/digital/digital-payments/samsung-pay/faqs/how-to-use">https://www.chase.com/digital/digital-payments/samsung-pay/faqs/how-to-use.  <i>Samsung Pay, Samsung, <a data-bbox="1360 831 1393 1518" href="https://www.samsung.com/us/samsung-pay/">https://www.samsung.com/us/samsung-pay/ (last visited Apr. 20, 2022); Samsung Money by SoFi, Samsung, <a data-bbox="1393 191 1425 1518" href="https://www.samsung.com/us/samsung-pay/samsung-money-by-sofi/">https://www.samsung.com/us/samsung-pay/samsung-money-by-sofi/ (last visited</i>

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device Apr. 20, 2022). See also https://www.techinsights.com/blog/samsung-galaxy-s20-teardown-analysis (showing NFC modules) Samsung Pay enabled watches also have NFC units. Make a payment using a Galaxy watch Samsung Pay can also be used on your Galaxy watch when you'd like to make quick in-store payments. Just make sure you have the Samsung Pay feature set up on your watch before you start making in-store purchases. 1. On your watch, press and hold the Back button to launch Samsung Pay. 2. Then, either rotate the bezel or swipe on the screen to locate your desired card. 3. Next, hold your wrist that's wearing the watch near an NFC reader or payment terminal. If you're having trouble, make sure to place the watch one inch or less from the terminal.  <i>Make an in-store payment with Samsung Pay, Samsung, https://www.samsung.com/us/support/answer/ANS00045102/ (last visited Apr. 20, 2022); see also Tech With Brett, <i>How to Setup and Use Samsung Pay</i>, YouTube (Oct. 1, 2018), https://youtu.be/zR3xz6GYIzc?t=389; Jessica Dolcourt, <i>How Samsung Pay works (pictures)</i>, CNET (Mar. 3, 2015 8:57 a.m. PT), https://www.cnet.com/pictures/how-samsung-pay-works-pictures/2/. See also, e.g., https://pocketnow.com/does-galaxy-watch-4-have-nfc/; https://www.ifixit.com/Teardown/Samsung+Galaxy+Watch+Teardown/117519 (step 9 showing NFC unit).</i> A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Samsung Pay is available on all Samsung computing devices. Lexy Savvides, Samsung Pay: Everything you need to know (FAQ), CNET, https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/. All Samsung computing devices include a touch screen panel.
1[b]: a touch sensor array;	

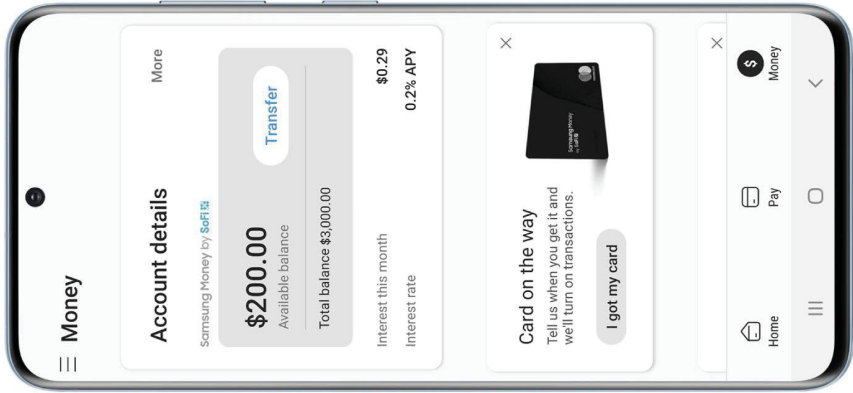
Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	 Touchscreen issues on a Galaxy phone or tablet Your Galaxy phone's or tablet's touchscreen is the main way of navigating your device, so we understand how worrisome it can be when the touch function isn't working properly. However, there are some simple ways to get the touchscreen working again when it's frozen, unresponsive, or acting funny. <i>Touchscreen issues on a Galaxy phone or tablet</i>, Samsung, https://www.samsung.com/us/support/troubleshooting/TSG01213974/ (last visited Aug. 29, 2022); <i>see also</i> Adjust your Galaxy phone's display settings, Samsung, https://www.samsung.com/us/support/answer/ANS00079034/ Samsung watches also have a touch sensor array.  Samsung smart watch does not turn on when using waking-up gestures Your watch is smart enough to know when to turn itself on and off. You can also manually change these wake-up settings to fit your preferences. However, if certain silent modes are turned on, such as Good night mode, the watch screen may not wake up when the wrist you're wearing the watch on is raised. Please follow the guidelines below to learn how to use wake-up gestures and adjust the feature's settings. <i>Samsung smart watch does not turn on when using waking-up gestures</i>, Samsung, https://www.samsung.com/us/support/troubleshooting/TSG01003202/ (last visited Aug. 29, 2022); <i>see also</i> https://www.youtube.com/watch?v=PltwjCFVJfs; https://www.samsung.com/us/watches/galaxy-watch4/.
I [c]: a display;	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Samsung Pay is available on all Samsung computing devices. Lexy Savvides, Samsung Pay: Everything you need to know (FAQ), CNET, https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/. All Samsung computing devices include a display. <i>See</i> Adjust your Galaxy phone's display settings, Samsung, https://www.samsung.com/us/support/answer/ANS00079034/ Samsung watches also have a display. https://www.youtube.com/watch?v=PltwjCFVJfs; <i>see also</i> https://www.samsung.com/us/watches/galaxy-watch4/; Claim 1 [b].

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Specifically, a Samsung Pay- and/or Samsung Wallet-enabled computing device includes a motion rate detection array, including, for example, and accelerometer, gyroscope, and a light sensor. Samsung Pay is available on all Samsung computing devices. Lexy Savvides, Samsung Pay: Everything you need to know (FAQ), CNET, https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/. All Samsung devices include a three-axis accelerometer, a gyroscope, and a light sensor. See Amboy Manalo, This Samsung Galaxy Dialer Code Lets You Test Each Sensor on Your Phone, Gadget Hacks (Mar. 5, 2018), https://android.gadgetsacks.com/how-to/samsung-galaxy-dialer-code-lets-you-test-each-sensor-your-phone-0183239/. See also https://www.techinsights.com/blog/samsung-galaxy-s20-teardown-analysis (noting STMicromicro accelerometer and gyroscope) Samsung watches also have a motion rate detection array. See, e.g., https://www.ifixit.com/Teardown/Samsung+Galaxy+Watch+Teardown/117519 (Step 10 noting STMicromicro accelerometer and gyroscope). See also https://developer.samsung.com/tizen/blog/en-us/2019/04/15/how-to-use-sensors-on-a-galaxy-watch (noting accelerometer) Also, many of the Samsung watch functions, such as fitness tracking, depend upon use of a motion rate detection array.
l[d]: a motion rate detection array;	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Specifically, a Samsung Pay- and/or Samsung Wallet-enabled computing device includes a memory that stores user data (e.g., name, phone number, passwords, credit and debit card information) and a currency amount (e.g., balances on rewards cards and Samsung Money).

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device  Edit your profile In order to use Samsung Pay, you'll need to enter certain information in your profile, such as your name and address. 1. To edit your profile, navigate to and open Samsung Pay, and then tap Menu (the three horizontal lines). 2. Tap Settings, and then swipe to and tap Profile. 3. You can edit your full name, phone number, and email address by tapping the desired field. You can also view your Samsung account ID, Samsung Pay registration date, and Device info from this page.  4. Tap Register new address to add a new address. Up to three addresses can be saved. 5. To set a particular address as your default, tap Edit (the pencil icon) next to your desired address, and then swipe to and select Default address. 6. Once you're done editing the address, tap Save to apply your changes. Edit your profile information in Samsung Pay, Samsung, https://www.samsung.com/us/support/answer/ANS0007842/.
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Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device Managing passwords and saved data with Samsung Pass You can manage your passwords and saved data within Samsung Pass. Go to Settings > Biometrics and security > Samsung Pass > then use your biometric data to log in to Samsung Pass. You will see a list of apps and websites that you are using with Samsung Pass under the Sign-in tab. Tap on each individual app or website to see the login details and passwords. You can then view, edit or delete your information for that app or website. To add or edit saved personal data such as your address or card information, tap on the Autofill forms tab at the bottom of the screen. You can then add, delete or edit your address and card information. What is Samsung Pass and how do I use it?, Samsung, https://www.samsung.com/uk/support/mobile-devices/what-is-samsung-pass/. Make a payment using Favorite Cards If you have the Favorite Cards feature activated on your phone, you can access your cards even faster. 1. To make a payment with your Favorite Cards, swipe up from the bottom of the screen. Then, swipe through and select your preferred card. 2. Select your preferred card. Tap Pay, and then choose your desired security option, such as entering your PIN or fingerprints. 3. Enter the required security information or simply place your finger on your phone's fingerprint scanner. 4. Next, hold the back of the phone up to the contactless reader and perform your desired actions to complete your purchase. 
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Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device Make an in-store payment with Samsung Pay, Samsung, https://www.samsung.com/us/support/answer/ANS00045102/.
	How can I view the balance of my gift card in Samsung Pay? The balance of your gift card will usually display in Samsung Pay. However, some merchants do not share this information. To check your gift card balance, open Samsung Pay, then tap Menu (the three horizontal lines), and then tap Cards. Tap the Gift tab, and then tap the card you want to view. The gift card balance will be displayed on the card's detail screen. To refresh the balance, tap the Refresh icon. Frequently asked questions about gift cards in Samsung Pay, Samsung, https://www.samsung.com/us/support/answer/ANS00081624/.

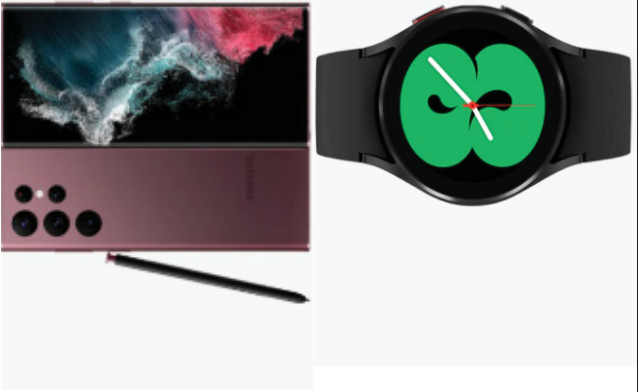


Introducing Samsung Money by SoFi: Do More With Your Money, Samsung. <https://news.samsung.com/us/introducing-samsung-money-samsung-pay-sofi/>.

See also <https://www.techinsights.com/blog/samsung-galaxy-s20-teardown-analysis> (showing DDR5). Discovery will reveal the particular memory in which the user data and currency amount are stored.

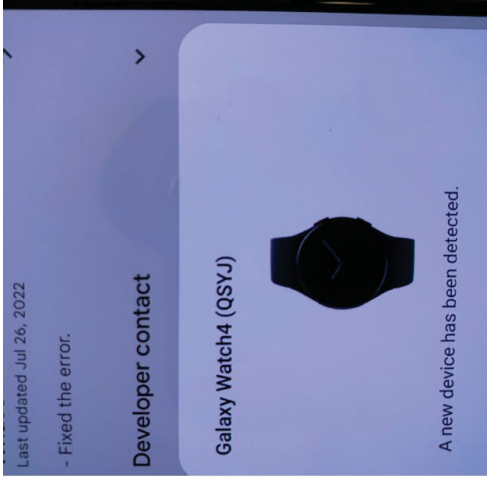
Samsung watches also have a memory. See, e.g., <https://www.samsung.com/global/galaxy/galaxy-watch4/specs/> (noting memory specifications).

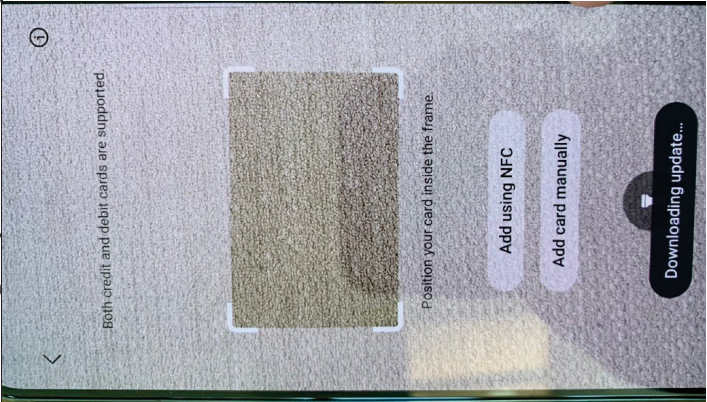
Discovery will reveal the particular memory in which the user data and currency amount are stored.

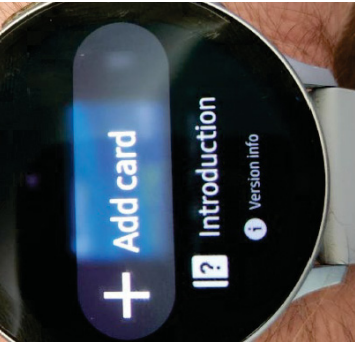
Claim No.	1[f]: a processor operatively coupled to the NFC unit, the touch sensor array, the display, the motion rate detection array, and the memory; Samsung Pay- and/or Samsung Wallet-enabled computing device A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Samsung Pay is available on all Samsung computing devices. Lexy Savvides, Samsung Pay: Everything you need to know (FAQ), CNET, https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/. All Samsung computing devices include a processor coupled to the NFC unit, the touch sensor array, the display, the motion rate detection array, and the memory. As the name suggests, the Octa-core processor is made up of eight processor cores that power Galaxy smartphones. The processor enables Galaxy smartphones to carry out more advanced tasks such as handling high resolution videos and graphic-heavy games without draining the battery, making the devices capable and efficient. The Octa-core processor also gives Galaxy devices faster load times. *Samsung's Galaxy smartphones run on either Octa-core (2.3GHz Quad + 1.6GHz Quad) or Quad-core (2.15GHz + 1.6GHz Dual) processors, depending on the country or carrier. <i>What is an Octa-core processor?</i>, Samsung, https://www.samsung.com/global/galaxy/what-is-octa-core-processor/ (last visited Aug. 29, 2022). Smartphone Samsung Exynos processors for smartphone is designed to deliver superior experience with powerful performance, energy efficiency and fast Internet connection. Galaxy S22 Ultra Exynos 2200 View all Smartwatch Samsung Exynos Processors specifically designed for smartwatch has realized the ultra-low power consumption in ultra-mini size with ultra-advanced functionalities. Galaxy Watch4 Exynos W920 View all 
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Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	<i>Showcase</i>, Samsung, https://semicondutor.samsung.com/processor/showcase/?wcmode=disabled (last visited Aug. 29, 2022); <i>Wearable Processor</i>, Samsung, https://semicondutor.samsung.com/processor/wearable-processor/ (last visited Aug. 29, 2022). See also https://www.techinsights.com/blog/samsung-galaxy-s20-teardown-analysis (noting processors); https://www.samsung.com/global/galaxy/galaxy-watch4/specs/ (noting Exynos processor). On information and belief, the processor is operatively coupled to the NFC unit, the touch sensor array, the display, the motion rate detection array, and the memory.
l[g]: a computer readable medium having instructions stored thereon that, responsive to execution by the electronic device, cause the electronic device to perform operations comprising:	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Samsung Pay is available on all Samsung computing devices, including watches. Lexy Savvides, Samsung Pay: Everything you need to know (FAQ), CNET, https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/. See also https://www.samsung.com/us/support/answer/ANS00061414/; Claim 1[Pre].
l[h]: accepting a user input of issued payments information input at a touch screen display of the electronic device,	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Samsung Pay is available on all Samsung computing devices. Lexy Savvides, Samsung Pay: Everything you need to know (FAQ), CNET, https://www.cnet.com/how-to/samsung-pay-everything-you-need-to-know-faq-mobile-wallet/. All Samsung computing devices include a touchscreen display. See Adjust your Galaxy phone's display settings, Samsung, https://www.samsung.com/us/support/answer/ANS00079034/. A Samsung Pay-enabled computing device accepts a user input of issued payments information input at a touch screen display. Specifically, the user input of issued payments information includes the credit card number, the Cardholder Name, the Expiration Date and Security Code (CVV), all of which is received by the Samsung Pay-enabled computing device at the step of adding a payment card to the Samsung Pay app.

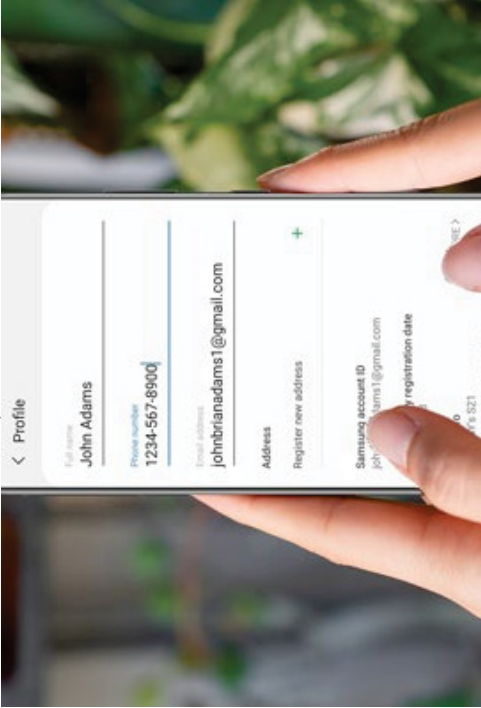
Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device How do I add my Chase cards to Samsung Pay? 1. Choose the Samsung Pay icon, and log in using your Samsung account information. 2. If you do not already have a Samsung account, you can create one. 3. Once logged in you can, touch ADD CARD in Samsung Pay app to begin the process of adding your card. 4. Center the card in the on-screen window and Samsung Pay will read the card number. Or you can enter the card number manually. 5. Verify or enter the additional information such as Cardholder Name, Expiration Date and Security Code (CV). 6. Accept the Terms and Conditions for adding a card to a digital wallet by touching AGREE TO ALL. 7. You may be prompted to select a delivery method for receiving a One Time Passcode, such as SMS or EMAIL or CALL IN. 8. The One Time Passcode will be delivered to the destination selected. Enter the code received and touch SUBMIT. Once complete, your card is ready for use in Samsung Pay. How to use Samsung Pay, Chase, https://www.chase.com/digital/digital-payments/samsung-pay/faqs/how-to-use. Make a payment using Favorite Cards If you have the Favorite Cards feature activated on your phone, you can access your cards even faster. 1. To make a payment with your Favorite Cards, swipe up from the bottom of the screen. Then, swipe through and select your preferred card. 2. Select your preferred card. Tap Pay, and then choose your desired security option, such as entering your PIN or fingerprints. 3. Enter the required security information or simply place your finger on your phone's fingerprint scanner. 4. Next, hold the back of the phone up to the contactless reader and perform your desired actions to complete your purchase.  Make an in-store payment with Samsung Pay, Samsung, https://www.samsung.com/us/support/answer/ANS00045102/.
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Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device As it concerns the Galaxy Watch, the following video is exemplary of how the Watch and mobile device can be used together. See https://www.youtube.com/watch?v=35bQrXXKuEUw starting at 1:39; and starting at 2:13 (showing use of a Samsung Watch in conjunction with a mobile device and how a user can input issued payments at a touch screen of the device). Samsung designs the Watch and mobile devices to work together, for example with the Samsung Wearable app, and as per the following functionality (which begins a connection process between the two devices):  Samsung Wallet includes the functionality of Samsung Pay as shown below. Through the Wallet App, a user is prompted to “Add Cards” which then permits either scanning or manual entry of, for example, issued payment information. The app further prompts a user to enter their name and confirmation information regarding the issued payment information. This is done through the touch screen display of the device.
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Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	 <i>See also https://www.samsung.com/us/samsung-wallet/ (“Samsung Pay is part of Samsung Wallet”)</i> As noted above, the watch is designed to be used as an extension of the Samsung mobile device and function together with the same. See also the following image showing how Watch and phone are used together to onboard new card information:

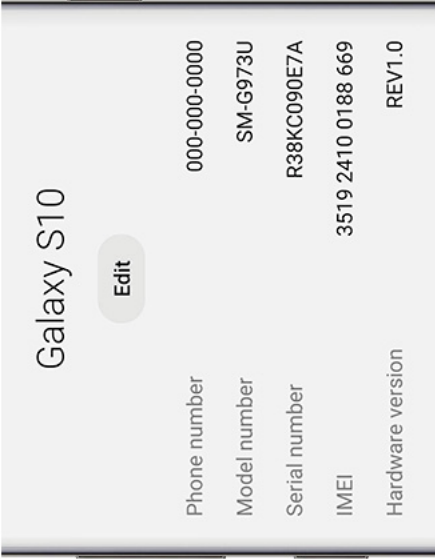
Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	 See also https://www.samsung.com/au/getstarted/advanced/samsungpay-on-gear-smartwatch/ (video starting at approx.. 1:37). The watch “add card” function works when a user interacts with the touch screen. To the extent that the watch does not meet this limitation literally, CardWare contends that it is met under the doctrine of equivalents because it performs the same function in the same way to achieve the same result (<i>i.e.</i>, accepting user payments via touch screen to allow contactless mobile payments for completion of secure payments).
1[i]: wherein the information comprising an issuer provided payment information;	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Specifically, the Samsung Pay-enabled computing device accepts issuer provided payment information, for example, the credit card number (also known as a the Primary Account Number, PAN), the Expiration Date and Security Code (CVV).

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device How do I add my Chase cards to Samsung Pay? 1. Choose the Samsung Pay icon, and log in using your Samsung account information. 2. If you do not already have a Samsung account, you can create one. 3. Once logged in you can, touch ADD CARD in Samsung Pay app to begin the process of adding your card. 4. Center the card in the on-screen window and Samsung Pay will read the card number. Or you can enter the card number manually. 5. Verify or enter the additional information such as Cardholder Name, Expiration Date and Security Code (CV). 6. Accept the Terms and Conditions for adding a card to a digital wallet by touching AGREE TO ALL. 7. You may be prompted to select a delivery method for receiving a One Time Passcode, such as SMS or EMAIL or CALL IN. 8. The One Time Passcode will be delivered to the destination selected. Enter the code received and touch SUBMIT. Once complete, your card is ready for use in Samsung Pay. How to use Samsung Pay, Chase, https://www.chase.com/digital-payments/samsung-pay/faqs/how-to-use Make a payment using Favorite Cards If you have the Favorite Cards feature activated on your phone, you can access your cards even faster. 1. To make a payment with your Favorite Cards, swipe up from the bottom of the screen. Then, swipe through and select your preferred card. 2. Select your preferred card. Tap Pay, and then choose your desired security option, such as entering your PIN or fingerprints. 3. Enter the required security information or simply place your finger on your phone's fingerprint scanner. 4. Next, hold the back of the phone up to the contactless reader and perform your desired actions to complete your purchase. 
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Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device Make an in-store payment with Samsung Pay, Samsung, https://www.samsung.com/us/support/answer/ANS00045102/.
1[]: wherein the memory comprises device-specific and user-specific information; and,	<i>See also limitation 1(h)</i> A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Specifically, the memory of the Samsung Pay-enabled computing device includes user-specific information (e.g., name, phone numbers, passwords, credit and debit card information etc.) and includes device-specific information (e.g., device name, serial number, etc.). 

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	Edit your profile In order to use Samsung Pay, you'll need to enter certain information in your profile, such as your name and address. 1. To edit your profile, navigate to and open Samsung Pay, and then tap Menu (the three horizontal lines). 2. Tap Settings, and then swipe to and tap Profile. 3. You can edit your full name, phone number, and email address by tapping the desired field. You can also view your Samsung account ID, Samsung Pay registration date, and Device info from this page.  4. Tap Register new address to add a new address. Up to three addresses can be saved. 5. To set a particular address as your default, tap Edit (the pencil icon) next to your desired address, and then swipe to and select Default address. 6. Once you're done editing the address, tap Save to apply your changes. Edit your profile information in Samsung Pay, Samsung, https://www.samsung.com/us/support/answer/ANS00078427/. Managing passwords and saved data with Samsung Pass You can manage your passwords and saved data within Samsung Pass. Go to Settings > Biometrics and security > Samsung Pass > then use your biometric data to log in to Samsung Pass. You will see a list of apps and websites that you are using with Samsung Pass under the Sign-in tab. Tap on each individual app or website to see the login details and passwords. You can then view, edit or delete your information for that app or website. To add or edit saved personal data such as your address or card information, tap on the Autofill forms tab at the bottom of the screen. You can then add, delete or edit your address and card information.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	What is Samsung Pass and how do I use it?, Samsung, https://www.samsung.com/uk/support/mobile-devices/what-is-samsung-pass/. Make a payment using Favorite Cards If you have the Favorite Cards feature activated on your phone, you can access your cards even faster. 1. To make a payment with your Favorite Cards, swipe up from the bottom of the screen. Then, swipe through and select your preferred card. 2. Select your preferred card. Tap Pay, and then choose your desired security option, such as entering your PIN or fingerprints. 3. Enter the required security information or simply place your finger on your phone's fingerprint scanner. 4. Next, hold the back of the phone up to the contactless reader and perform your desired actions to complete your purchase. Make an in-store payment with Samsung Pay, Samsung, https://www.samsung.com/us/support/answer/ANS00045102/. 

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device										
	 The screenshot shows the 'About' page of a Samsung S10. At the top, it says 'Galaxy S10' with an 'Edit' button. Below are the following details: <table border="1"> <tr> <td>Phone number</td> <td>000-000-0000</td> </tr> <tr> <td>Model number</td> <td>SM-G973U</td> </tr> <tr> <td>Serial number</td> <td>R38KC090E7A</td> </tr> <tr> <td>IMEI</td> <td>3519 2410 0188 669</td> </tr> <tr> <td>Hardware version</td> <td>REV1.0</td> </tr> </table> Finding your phone and tablet's IMEI, model number, or serial number, Samsung, https://www.samsung.com/us/support/answer/ANS00048604/; <i>see also</i> How to retrieve the Device Unique ID from android device, Samsung Developers (Jul. 8, 2011), https://developer.samsung.com/galaxy/others/retrieving-device-unique-id. The watch also includes a memory storing device-specific information. The following information may be displayed: • Watch phone number: Displays the watch's phone number if the watch has LTE service. • Model number: Displays the model number. • Serial number: Displays the serial number. • IMEI: Displays the watch's unique IMEI number. Bluetooth-only watches and fitness bands will not have an IMEI. • Storage: Displays the available storage space. • Device: Access information about the watch, such as its EID, IMEI, or ICCD. https://www.samsung.com/us/support/answer/ANS00084450/	Phone number	000-000-0000	Model number	SM-G973U	Serial number	R38KC090E7A	IMEI	3519 2410 0188 669	Hardware version	REV1.0
Phone number	000-000-0000										
Model number	SM-G973U										
Serial number	R38KC090E7A										
IMEI	3519 2410 0188 669										
Hardware version	REV1.0										

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device The Samsung Watch also includes a memory storing user-specific information which includes, for example, name, phone numbers, passwords, credit and debit card information etc. as well as other personal information such as location, contacts, daily activity, body composition, sleep, ECG, heart rate and stress. A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Specifically, the Samsung Pay-enabled computing device wirelessly sends the user provided payment information (e.g., the credit card number (also known as the Primary Account Number, PAN)) to the token service provider (TSP).
I[k]: wherein the user provided payment information is communicated wirelessly; and,	3.1 In-Store EMV Contactless Payments with Device-Centric Digital Wallets Apple, Google, and Samsung were among the first to implement EMV payment tokens in digital wallets that hold credentials for several payments use cases. These device-centric digital wallets play the role of a token requestor; they may capture the cardholder's PAN and request that it be replaced with a payment token from a TSP. Tokenization of payment credentials in digital wallets enables issuers to establish a secure presence on a wallet. Payment Tokenization Primer and Lessons Learned, US Payments Forum, https://www.uspaymentsforum.org/wp-content/uploads/2019/06/EMV-Payment-Tokenization-Primer-Lessons-Learned-FINAL-June-2019.pdf EMV

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	5.1.3.2 Token Generation Token Generation is the process of creating a Payment Token and its associated Token Expiry Date and mapping it to a specific underlying PAN, for use by a specific Token Requestor and Token Domain(s), as identified the Token Requestor ID. The Token Service Provider SHALL facilitate the generation of a Payment Token and related data. This may be in response to a Token Request from a registered Token Requestor with a valid Token Requestor ID or an existing Payment Token may be mapped to an underlying PAN in response to a Token Request from a registered Token Requestor with a valid Token Requestor ID. 5.1.3.3 Token Issuance Token Issuance is the process of issuing a Payment Token and related data in preparation for Token Provisioning. The Token Service Provider SHALL manage Token Requests based on the Token Requestor ID. Token Service Providers SHALL manage the issuance of Payment Tokens. Payment Tokens SHALL only be issued through the response to a Token Request from a registered Token Requestor with a valid Token Requestor ID. 5.1.3.4 Token Provisioning Token Provisioning is the process of delivering a Payment Token and related data to the Token Location. Token Provisioning SHOULD be carried out by the Token Service Provider or by other authorised entities on its behalf. The methodologies associated with Token Provisioning may be proprietary to each Token Programme and are outside the scope of this technical framework. Payment Tokenisation Specification – Technical Framework v2.1 at 35–36 (Jun. 14, 2019) <i>available at</i> https://www.emvco.com/emv-technologies/payment-tokenisation/. EMVCo, EMV® See also: https://www.uspaymentsforum.org/wp-content/uploads/2019/06/EMV-Payment-Tokenization-Primer-Lessons-Learned-FINAL-June-2019.pdf (pg. 8, “typically there is a unique token for each device...”; see <i>also</i> Fig. 5, showing provisioning flow; p. 23 and 25 (referring to Samsung Pay)

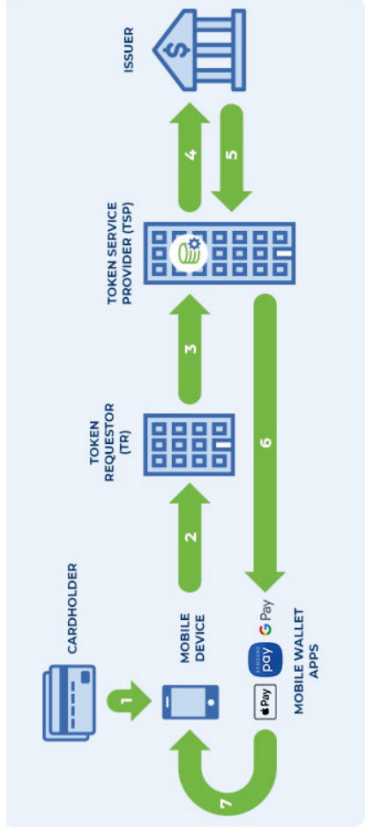
Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device On information and belief, the watch also wirelessly communicates user provided payment information, either directly or via the phone, in order to receive in response a unique device specific token. See, e.g., : https://www.uspaymentsforum.org/wp-content/uploads/2019/06/EMV-Payment-Tokenization-Primer-Lessons-Learned-FINAL-June-2019.pdf (pg. 8, “typically there is a unique token for each device...”; see also Fig. 5, showing provisioning flow; p. 23 and 25 (referring to Samsung Pay)) To the extent that the watch does not meet this limitation literally, CardWare contends that it is met under the doctrine of equivalents because it performs the same function in the same way to achieve the same result (i.e., as set out above, the mobile phone and Watch are designed to be used together for purposes of using Samsung Pay. The watch and phone combined perform the same function (providing user provided payment information to a Token Service Provider), in the same way (over a wireless connection) to achieve the same result (setting up a secure environment and receiving specific information from a TSP, as set out below)). A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Specifically, the Samsung Pay-enabled computing device wirelessly receives a token containing a Device Account Number (“DAN”; also referred to as a Virtual Account Number) from the token service provider (TSP).
1[]: wirelessly receiving a static device account number payment information for storage on the electronic device; and	3.1 In-Store EMV Contactless Payments with Device-Centric Digital Wallets Apple, Google, and Samsung were among the first to implement EMV payment tokens in digital wallets that hold credentials for several payments use cases. These device-centric digital wallets play the role of a token requestor; they may capture the cardholder’s PAN and request that it be replaced with a payment token from a TSP. Tokenization of payment credentials in digital wallets enables issuers to establish a secure presence on a wallet. EMV Payment Tokenization Primer and Lessons Learned, US Payments Forum, https://www.uspaymentsforum.org/wp-content/uploads/2019/06/EMV-Payment-Tokenization-Primer-Lessons-Learned-FINAL-June-2019.pdf

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	5.1.3.2 Token Generation Token Generation is the process of creating a Payment Token and its associated Token Expiry Date and mapping it to a specific underlying PAN, for use by a specific Token Requestor and Token Domain(s), as identified the Token Requestor ID. The Token Service Provider SHALL facilitate the generation of a Payment Token and related data. This may be in response to a Token Request from a registered Token Requestor with a valid Token Requestor ID or an existing Payment Token may be mapped to an underlying PAN in response to a Token Request from a registered Token Requestor with a valid Token Requestor ID. 5.1.3.3 Token Issuance Token Issuance is the process of issuing a Payment Token and related data in preparation for Token Provisioning. The Token Service Provider SHALL manage Token Requests based on the Token Requestor ID. Token Service Providers SHALL manage the issuance of Payment Tokens. Payment Tokens SHALL only be issued through the response to a Token Request from a registered Token Requestor with a valid Token Requestor ID. 5.1.3.4 Token Provisioning Token Provisioning is the process of delivering a Payment Token and related data to the Token Location. Token Provisioning SHOULD be carried out by the Token Service Provider or by other authorised entities on its behalf. The methodologies associated with Token Provisioning may be proprietary to each Token Programme and are outside the scope of this technical framework. Payment Tokenisation Specification – Technical Framework v2.1 at 35–36 (Jun. 14, 2019) available at https://www.emvco.com/emv-technologies/payment-tokenisation/. EMVCo, EMV® Also, as shown in our internal testing, the static device account number is used for Samsung Pay MST, evidencing the fact that it was received by the phone.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	Card Swipe  SamsungPay MST  Swipe Card Track#1 : 8434256XXXXX35939~WYATT/ DAVID. ^21072010000000. 00930000000 Track#2 : 434256XXXXXX5939=21072010000000330 PAN CVV First SamsungPay payment attempt Track#1 : 465098XXXXXX0448=231210160390000009281 Track#2 : 465098XXXXXX0448=23121016039000009281 PAN DAN Retry, second SamsungPay payment Track#1 : 465098XXXXXX0448=231210160390000010752 Track#2 : 465098XXXXXX0448=231210160390000010752 PAN DAN Dynamic CVV

Source: Internal testing.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	In general terms, the process for registering a card in a mobile wallet is as follows: 1. The cardholder uses a device that supports the digital wallet application and registers a card, entering the data into the application. 2. The application sends the data to a <i>Token Requestor</i> (TR). 3. The TR sends the data to the <i>Token Service Provider</i> (TSP) with which it is registered and makes a registration request for a new token. 4. The TSP verifies the data with the card issuer. 5. If everything is correct, the TSP registers the PAN and links it to a new token in a secure database (<i>Token Vault</i>). Along with the TR identifier, the token expiration date, and a number of additional security features called <i>Token Domain</i>, including restrictions on the use of the new token on certain channels, use by a particular merchant, limitation on the number of permitted uses, and verification of the cryptogram. 6. The TSP notifies the application of the newly generated token. 7. The application stores the generated token (<i>Device Account Number</i> (DAN) for Apple Pay or Digitized PAN (DPAN) for Samsung Pay) in a secure location (Secure Element (SE) or Host Card Emulation (HCE)).

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device  <i>Figure 1. Payment token creation request diagram</i> Mobile payments with digital wallets and tokenization: How Google Pay, Apple Pay and Samsung Pay protect your card details, Advantio, https://www.advantio.com/blog/mobile-payments-with-digital-wallets-and-tokenization-how-google-pay-apple-pay-and-samsung-pay-protect-your-card-details The Watch also independently wirelessly receives its own unique static device account number payment information for storage on the electronic device. See also: https://www.uspaymentsforum.org/wp-content/uploads/2019/06/EMV-Payment-Tokenization-Primer-Lessons-Learned-FINAL-June-2019.pdf (pg. 8, “typically there is a unique token for each device...”; see also Fig. 5, showing provisioning flow; p. 23 and 25 (referring to Samsung Pay)) To the extent that the Watch does not meet this limitation literally, CardWare contends that it is met under the doctrine of equivalents because it performs the same function in the same way to achieve the same result (i.e., as set out above, the mobile phone and Watch are designed to be used together for purposes of using Samsung Pay. The Watch and phone combined perform the same function (receiving static device account number payment information), in the same way (over a wireless connection) to achieve the same result (setting up a secure environment and receiving specific information from a TSP, as set out below)).
I[m]: wherein at least a portion of the payment information is a	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Page 28 of 60

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device Specifically, the Samsung Pay-enabled computing devices transmits payment information having two parts, the DAN/DPAN and a transaction-specific security code (also known as the cryptogram), the latter of which is the limited-use number, also known as the one-time limited use number. The combination of information used by Samsung Pay is also of limited use. The DAN/DPAN and the cryptogram are both used in place of a issuer provided payment information; and, Data security Tokenization creates a unique randomized set of numbers to be used at each new transaction, so your real card number is never used from your phone. https://www.samsung.com/us/samsung-pay/. The Samsung Pay enabled computing device generates the cryptogram using at least three pieces of information: the digital token, the application transaction counter (ATC), and a secret key. 3. How is a cryptogram generated? A cryptogram is generated using at least three pieces of information: the digital token, the application transaction counter (ATC), and a secret key. The cryptogram is designed to appear fully random to anyone that does not have the secret key. This works to prevent a cryptogram from being guessed. The secret key is generated by the payment networks and is protected, end to end, between the payment networks and TrustZone on the device. Only one cryptogram can be generated per explicit user authorization. The cryptograms are used to tie an ATC to a digital token and help to prevent modification of the ATC. This in turn helps to prevent transaction information used for one purchase from being reused for multiple purchases. FAQs, Samsung, https://security.samsungmobile.com/doc/Press_Guidance_Samsung_Pay.pdf Also, as can be seen during testing, the CVV value changes for each transaction using Samsung Pay MST.
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Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
device secrets; time; merchant; facility location; sequence count; payment information; account information; amount; and transaction information; and	Data security Tokenization creates a unique randomized set of numbers to be used at each new transaction, so your real card number is never used from your phone. https://www.samsung.com/us/samsung-pay/ “The original PAN of the card is never stored on the end user's device. Instead, the payment token with which subsequent transactions are made is securely stored. Let's walk through this: 1. The cardholder (in this case, the same user of the digital wallet application) makes use of the payment application, presenting the payment token to the merchant from his/her device using any of the following channels: • EMV Contactless: If the Point of Sale (POS) terminal supports contactless payments via NFC (Near Field Communication), the EMV contactless specification is used to perform the data transfer. • Contactless MSD: If the payment terminal does not support contactless payments under the EMV specification, then the device can employ the contactless MSD (magnetic stripe data) mode that emulates a magnetic stripe transaction. 2. The merchant sends the token [containing the DAN] and dynamic cryptogram data to the acquirer. 3. The acquirer routes the transaction to the payment network in the same way as a normal transaction would proceed. 4. The payment network determines that it is a token and not a PAN, as the token has a specific BIN. It thereby routes the transaction to the related Token Service Provider (TSP). 5. The TSP validates the token, the related cryptogram, the Token Requestor (TR) identifier and the Token Domain usage restrictions. If everything is correct, proceed with de-tokenization and sends the original PAN data to the payment network. 6. The payment network sends the original PAN data to the sender. 7. The issuer validates the transaction with the original PAN data and sends the response to the payment network.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	8. The payment network replaces the original PAN with the payment token initially received and sends it to the acquirer. 9. The acquirer notifies the merchant of the result of the transaction.” Mobile payments with digital wallets and tokenization: How Google Pay, Apple Pay and Samsung Pay protect your card details, Advantio, https://www.advantio.com/blog/mobile-payments-with-digital-wallets-and-tokenization-how-google-pay-apple-pay-and-samsung-pay-protect-your-card-details The cryptogram is generated by the Samsung Pay enabled computing device using at least three pieces of information: the digital token, the application transaction counter (ATC), and a secret key.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	3. How is a cryptogram generated? A cryptogram is generated using at least three pieces of information: the digital token, the application transaction counter (ATC), and a secret key. The cryptogram is designed to appear fully random to anyone that does not have the secret key. This works to prevent a cryptogram from being guessed. The secret key is generated by the payment networks and is protected, end to end, between the payment networks and TrustZone on the device. Only one cryptogram can be generated per explicit user authorization. The cryptograms are used to tie an ATC to a digital token and help to prevent modification of the ATC. This in turn helps to prevent transaction information used for one purchase from being reused for multiple purchases. FAQs, Samsung, https://security.samsungmobile.com/doc/Press_Guidance_Samsung_Pay.pdf Also, as can be seen during testing, the CVV value changes for each transaction using Samsung Pay MST.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	Card Swipe  Mag-Stripe Reader Galaxy S7 SamsungPay MST  PAN x5939 DAN x0448 Swipe Card Track#1 : 8434256XXXXX35939~WYATT/ DAVID. ^21072010000000. 00930000000 Track#2 : 434256XXXXXX5939-210720100000000930 PAN CW First SamsungPay payment attempt Track#1 : 465098XXXXXX0448=231210160390000009281 Track#2 : 465098XXXXXX0448=231210160390000009281 PAN DAN Retry, second SamsungPay payment Track#1 : 465098XXXXXX0448=231210160390000010752 Track#2 : 465098XXXXXX0448=231210160390000010752 PAN DAN Dynamic CW Source: Internal testing. Samsung Pay enabled watches contain the same functionality as set out above and, on information and belief, can generate unique one-time limited use numbers. A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:
I[fo]: using said static device account number and said dynamically generated one-time limited-use number together in the place of issuer provided payment information for making a payment transaction.	

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	Data security Tokenization creates a unique randomized set of numbers to be used at each new transaction, so your real card number is never used from your phone. https://www.samsung.com/us/samsung-pay/ As explained by Samsung, the Samsung Pay enabled computing device uses three numbers, including the DAN/DPAN (or token) and the cryptogram for making a payment transaction. 1. How does Samsung Pay work? Each time Samsung Pay is used for a transaction, the Samsung Pay handset sends at least three pieces of information. The first is a digital token that represents the credit or debit card information. The digital token is a surrogate credit or debit card number. The digital token's primary purpose is to route transactions to the correct payment network and to the correct issuer. The second piece of information is the application transaction counter (ATC). The ATC is a counter that is updated for every transaction. Its purpose is to help ensure that the same transaction information cannot be replayed to make multiple purchases. Payment networks use this number to track the sequence of transactions and determine whether an attempted transaction is older than the last one approved or is otherwise out of sequence. If so, it is an indication that something is amiss, and appropriate action can be taken. The third piece of information is the cryptogram. The cryptogram is an authentication code generated using, at a minimum, a secret key, the digital token and the ATC. Cryptograms serve to validate that the transaction information has not been modified and that it was generated by the expected user's handset. FAQs, Samsung, https://security.samsungmobile.com/doc/Press_Guidance_Samsung_Pay.pdf “The original PAN of the card is never stored on the end user's device. Instead, the payment token with which subsequent transactions are made is securely stored. Let's walk through this:

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	1. The cardholder (in this case, the same user of the digital wallet application) makes use of the payment application, presenting the payment token to the merchant from his/her device using any of the following channels: • EMV Contactless: If the Point of Sale (POS) terminal supports contactless payments via NFC (Near Field Communication), the EMV contactless specification is used to perform the data transfer. • Contactless MSD: If the payment terminal does not support contactless payments under the EMV specification, then the device can employ the contactless MSD (magnetic stripe data) mode that emulates a magnetic stripe transaction. 2. The merchant sends the token [containing the DAN] and dynamic cryptogram data to the acquirer. 3. The acquirer routes the transaction to the payment network in the same way as a normal transaction would proceed. 4. The payment network determines that it is a token and not a PAN, as the token has a specific BIN. It thereby routes the transaction to the related Token Service Provider (TSP). 5. The TSP validates the token, the related cryptogram, the Token Requestor (TR) identifier and the Token Domain usage restrictions. If everything is correct, proceed with de-tokenization and sends the original PAN data to the payment network. 6. The payment network sends the original PAN data to the sender. 7. The issuer validates the transaction with the original PAN data and sends the response to the payment network. 8. The payment network replaces the original PAN with the payment token initially received and sends it to the acquirer. 9. The acquirer notifies the merchant of the result of the transaction.”

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	The diagram illustrates the Samsung Pay transaction flow involving a Mobile Device, a Merchant/Contactless Payment Terminal, an Acquirer, a Payment Network, an Issuer, and a Token Service Provider (TST). The process is numbered 1 through 9: 1. Mobile Device initiates payment to Merchant/Contactless Payment Terminal. 2. Merchant/Contactless Payment Terminal sends data to Acquirer. 3. Acquirer sends data to Payment Network. 4. Payment Network sends data to TST. 5. TST sends data to Issuer. 6. Issuer sends data to Payment Network. 7. Payment Network sends data to Acquirer. 8. Acquirer sends data to Merchant/Contactless Payment Terminal. 9. Merchant/Contactless Payment Terminal completes transaction with Mobile Device. Mobile payments with digital wallets and tokenization: How Google Pay, Apple Pay and Samsung Pay protect your card details, Advantio, https://www.advantio.com/blog/mobile-payments-with-digital-wallets-and-tokenization-how-google-pay-apple-pay-and-samsung-pay-protect-your-card-details Also, as shown in our internal testing, the CVV value changes for each transaction using Samsung Pay MST.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
4: The electronic device of claim 1, wherein the user input comprises one or more of: An introduction to a transaction-specific identifier;	Card Swipe  Mag-Stripe Reader Galaxy S7 SamsungPay MST  PAN x5939 DAN x0448 Swipe Card Track#1 : 8434256XXXXXX35939~WYATT/ DAVID. ^21072010000000. 00930000000 Track#2 : 434256XXXXXX5939=21072010000000030 CVV PAN First SamsungPay payment attempt Track#1 : 465098XXXXXX0448=231210160390000009281 Track#2 : 465098XXXXXX0448=231210160390000009281 DAN Retry, second SamsungPay payment Track#1 : 465098XXXXXX0448=231210160390000010752 Track#2 : 465098XXXXXX0448=231210160390000010752 Dynamic CVV Source: Internal testing. Samsung Pay enabled watches contain the same functionality as set out above. A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: For example, the following illustrates a checkout function requiring user input on the display.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
identifier, a user secret, and a credit card authority secret and the processor is operable to generate a limited-duration credit card number therefrom.	As explained by Samsung, the Samsung Pay enabled computing device uses three numbers, including the DAN/DPAN (or token) and the cryptogram for making a payment transaction. The cryptogram is of limited duration and uses the application transaction counter in combination with a secret key and the digital token. The combination of information sent by Samsung Pay is also of limited duration. 1. How does Samsung Pay work? Each time Samsung Pay is used for a transaction, the Samsung Pay handset sends at least three pieces of information. The first is a digital token that represents the credit or debit card information. The digital token is a surrogate credit or debit card number. The digital token's primary purpose is to route transactions to the correct payment network and to the correct issuer. The second piece of information is the application transaction counter (ATC). The ATC is a counter that is updated for every transaction. Its purpose is to help ensure that the same transaction information cannot be replayed to make multiple purchases. Payment networks use this number to track the sequence of transactions and determine whether an attempted transaction is older than the last one approved or is otherwise out of sequence. If so, it is an indication that something is amiss, and appropriate action can be taken. The third piece of information is the cryptogram. The cryptogram is an authentication code generated using, at a minimum, a secret key, the digital token and the ATC. Cryptograms serve to validate that the transaction information has not been modified and that it was generated by the expected user's handset. https://security.samsungmobile.com/doc/Press_Guidance_Samsung_Pay.pdf FAQs, Samsung, See <i>also</i> internal testing below. On information and belief, the functionality is the same for both MST and NFC transactions, across both mobile phones and watches.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	Card Swipe  Mag-Stripe Reader Galaxy S7 SamsungPay MST  PAN x5939 DAN x0448 Swipe Card Track#1 : 8434256XXXXXX35939~WYATT/ DAVID. ^21072010000000. 00930000000 Track#2 : 434256XXXXXX5939=21072010000000030 CVV First SamsungPay payment attempt Track#1 : 465098XXXXXX0448=231210160390000009281 PAN Track#2 : 465098XXXXXX0448=231210160390000009281 DAN Retry, second SamsungPay payment Track#1 : 465098XXXXXX0448=231210160390000010752 Track#2 : 465098XXXXXX0448=231210160390000010752 Dynamic CVV Source: Internal testing. Samsung Pay enabled watches contain the same functionality as set out above. A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: As shown in our internal testing, the CVV value changes for each transaction using Samsung Pay MST.
6 The electronic device of claim 1, wherein the limited-use number has a limited recurrence, and is limited in scope of use to a predetermined number of authorized transactions.	

Card Swipe



SamsungPay MST



Swipe Card
Track#1 : 8434256XXXXX35939~WYATT/ DAVID. ^21072010000000. 00930000000
Track#2 : 434256XXXXXX5939=21072010000000030 CVV
First SamsungPay payment attempt
Track#1 : 465098XXXXXX0448=231210160390000009281 PAN
Track#2 : 465098XXXXXX0448=231210160390000009281 DAN
Retry, second SamsungPay payment
Track#1 : 465098XXXXXX0448=231210160390000010752 Dynamic CVV
Track#2 : 465098XXXXXX0448=231210160390000010752 DAN

Source: Internal testing.

Samsung Pay enabled watches contain the same functionality as set out above.

See also:

<https://www.uspaymentsforum.org/wp-content/uploads/2019/06/EMV-Payment-Tokenization-Primer-Lessons-Learned-FINAL-June-2019.pdf>

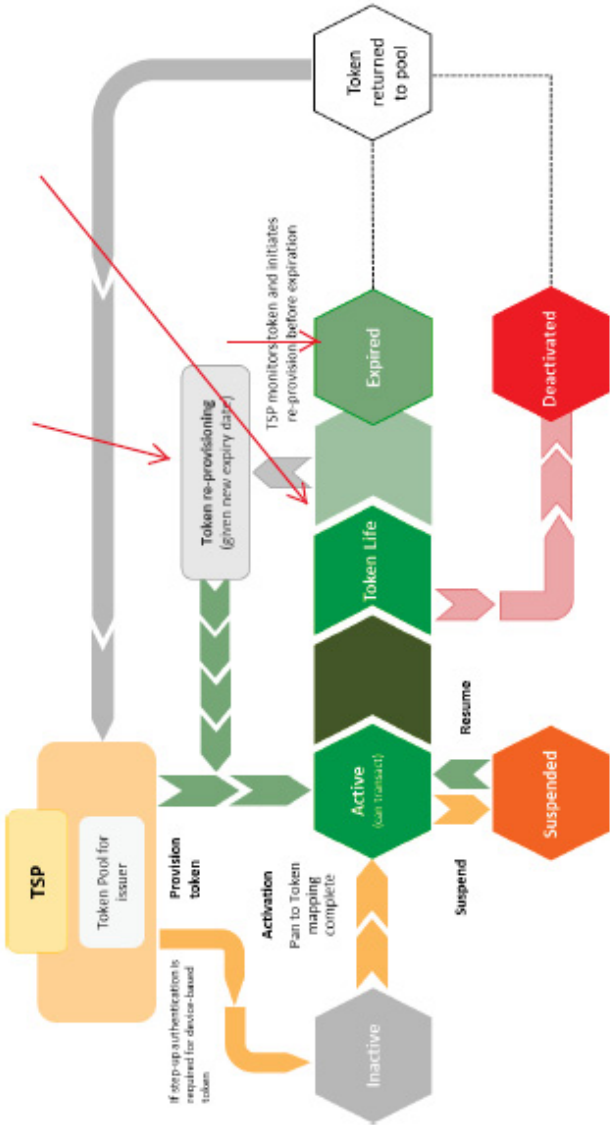


Figure 4. Lifecycle Stages of a Token and Token Status

P. 19

Tokens, like PANs, have an expiration date. *Expired* tokens may be deactivated, although they may remain on the token requestor's device. Tokens that expire typically are not used again and remain unusable for transactions in a deactivated state. There is an option for TSPs to re-use these expired tokens after an appropriate amount of time allowing for clearing, chargeback and dispute processes to complete. This process ensures that a TSP's available pool of token numbers is not depleted. Another way to extend the life of a token and reduce the depletion of useable tokens is by re-provisioning the token.

P. 20

Token Cryptogram. A cryptogram, containing a transaction-unique value, typically generated using the payment token, payment-token-related data, and transaction data. Cryptogram derivation methods may vary by scenario and may be payment system specific.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	P. 41 <i>See also:</i> 1. How does Samsung Pay work? Each time Samsung Pay is used for a transaction, the Samsung Pay handset sends at least three pieces of information. The first is a digital token that represents the credit or debit card information. The digital token is a surrogate credit or debit card number. The digital token's primary purpose is to route transactions to the correct payment network and to the correct issuer. The second piece of information is the application transaction counter (ATC). The ATC is a counter that is updated for every transaction. Its purpose is to help ensure that the same transaction information cannot be replayed to make multiple purchases. Payment networks use this number to track the sequence of transactions and determine whether an attempted transaction is older than the last one approved or is otherwise out of sequence. If so, it is an indication that something is amiss, and appropriate action can be taken. The third piece of information is the cryptogram. The cryptogram is an authentication code generated using, at a minimum, a secret key, the digital token and the ATC. Cryptograms serve to validate that the transaction information has not been modified and that it was generated by the expected user's handset. https://security.samsungmobile.com/doc/Press_Guidance_Samsung_Pay.pdf FAQs, Samsung, The cryptogram is based in part on an application transaction counter, which is updated for every transaction.
7: The electronic device of claim 1, wherein the display enables information to be displayed regarding the limited-use number, the time, a passcode, a sequence code, a currency amount, and other credit card transaction information of the user, a	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: The following images and explanation are illustrative: Mobile phones: The following illustration shows merchant name, the DAN, and a currency amount.

Claim No.

Samsung Pay- and/or Samsung Wallet-enabled computing device



<https://www.samsung.com/us/samsung-pay/>

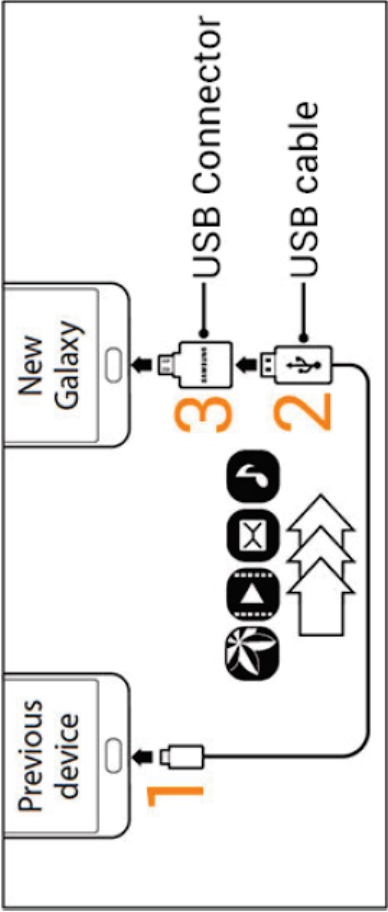
The following video demonstrates entry of a pin, adding a card where bank and credit card transaction information is displayed. <https://www.youtube.com/watch?v=tGt-fs2-dXw>. It also displays the DAN in connection with performing a transaction. The Galaxy phone also can display the time of day.

Watches:

Watches also have display capabilities including the following:

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	 Samsung Pay on a watch also requires a PIN. See https://www.samsung.com/us/support/answer/ANS00061414/ To the extent this limitation is not literally met by the Watch, it is met under the doctrine of equivalents since the watch is designed to work together with Samsung-Pay enabled mobile phones. Samsung Pay enabled mobile phones have the display capabilities outlined above.
8: The electronic device of claim 1, wherein the payment transaction comprises a	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:

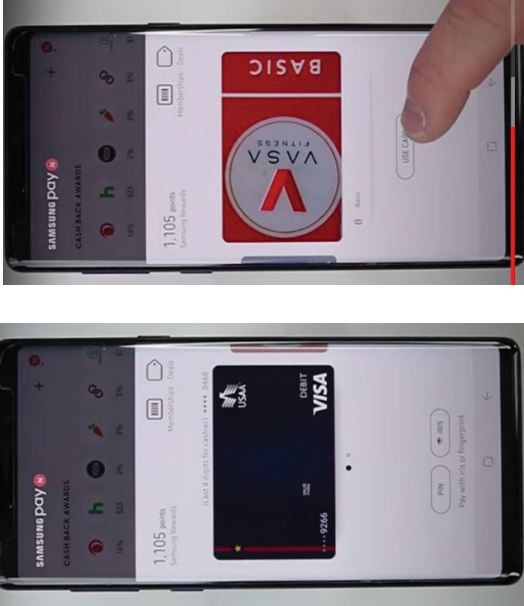
Claim No. cryptographic hash of the transaction unit, wherein the cryptographic hash is processed and stored in said memory.	Samsung Pay- and/or Samsung Wallet-enabled computing device Samsung Pay uses a cryptographic hash including the cryptogram described below. Per the same document, the hash is stored in memory. 1. How does Samsung Pay work? Each time Samsung Pay is used for a transaction, the Samsung Pay handset sends at least three pieces of information. The first is a digital token that represents the credit or debit card information. The digital token is a surrogate credit or debit card number. The digital token's primary purpose is to route transactions to the correct payment network and to the correct issuer. The second piece of information is the application transaction counter (ATC). The ATC is a counter that is updated for every transaction. Its purpose is to help ensure that the same transaction information cannot be replayed to make multiple purchases. Payment networks use this number to track the sequence of transactions and determine whether an attempted transaction is older than the last one approved or is otherwise out of sequence. If so, it is an indication that something is amiss, and appropriate action can be taken. The third piece of information is the cryptogram. The cryptogram is an authentication code generated using, at a minimum, a secret key, the digital token and the ATC. Cryptograms serve to validate that the transaction information has not been modified and that it was generated by the expected user's handset. https://security.samsungmobile.com/doc/Press_Guidance_Samsung_Pay.pdf FAQs, Samsung,
9.: The electronic device of claim 1, further comprising a USB connector for connection to a standard computing device.	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: https://www.samsung.com/us/support/troubleshooting/TSG01212959/

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	Transfer Content via Smart Switch  https://www.samsung.com/za/support/mobile-devices/s7-how-do-i-use-the-usb-connector-to-connect-my-samsung-galaxy-s7-to-my-previous-device/ Certain Samsung watches also have USB connectors.
II. Claim 10 and Dependent Claims 11-17	

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
10 [Pre]: A method of storing and generating payment information in an electronic device, the method comprising:	See Claim 1[h].
10[a]: Accepting a user input of issued payment information input at a touch screen display of the electronic device, wherein the information comprises an issuer provided payment information;	See Claim 1[h] and 1[i].
10[b]: Wherein the electronic device comprises device-specific and user-specific information; and	See Claim 1[j].

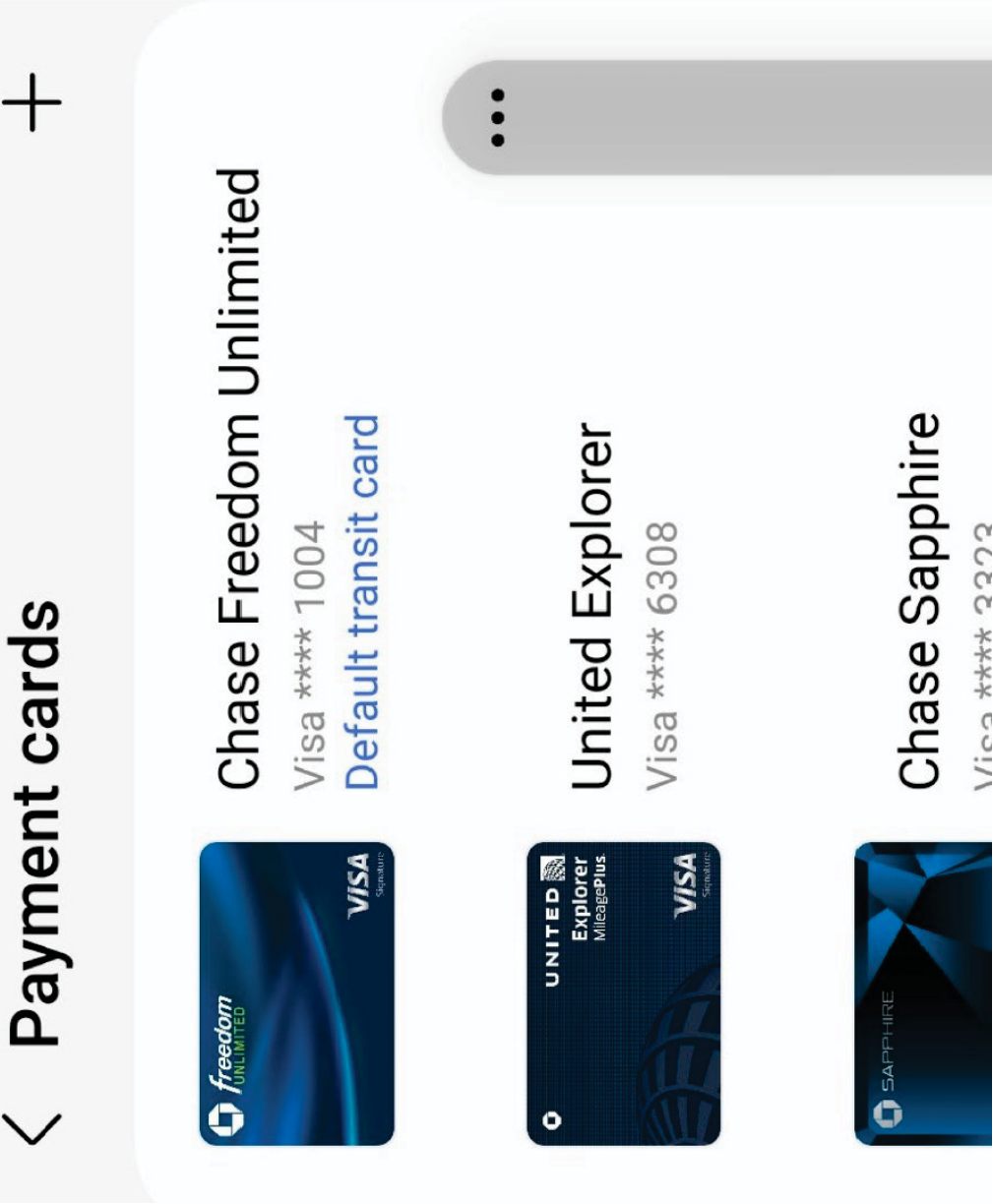
Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
10[c]: Wherein the issuer provided payment information is communicated wirelessly; and	See Claim 1[k].
10[d]: Receiving wirelessly a static device account number payment information for storage on the electronic device; and wherein	See Claim 1[l].
10[e]: At least a portion of the payment information is a limited use number for limited use by the device, in place of a issuer provided payment information; and,	See Claim 1[m].
10[f]: Dynamically generating a one-time limited-use number based on at least one of a set of information including: user-identifying information; user secrets; device information; device secrets; time; merchant; facility location; sequence count; payment information; account information; amount; and transaction information; and	See Claim 1[n].
10[g]: Using said static device account number and said dynamically generated one-time limited-use number together in the place of issuer provided payment information for making a payment transaction.	See claim 1[o].
11: The method of claim 10, wherein the electronic device is configured to accept the user input by at least one of a means	See Claims 1[h] and 1[i].

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
comprising: a touch sensor array; a touch screen; a keypad; buttons; device motion; an accelerometer, a biometric input; a proximity contact sensor; optical sensors; an NFC unit; a wireless interface; a USB wired connection; a USB connection; an RF antenna; an inductor assembly.	
12: The method of claim 10, wherein the device-specific information comprises at least one of a set including: device identifiers; device secrets; device keys; device usage sequence counters; and device account numbers.	See Claim 1[j].
13: The method of claim 10, wherein the user-specific information comprises at least one of a set comprising: an email address; a username; a password; a PIN; a passcode; gestures; user information; bank accounts; payment information; device account numbers; merchant accounts; online accounts; currency amount; currency type; cryptocurrency address; cryptocurrency keys; private/public keys; signature information; and user secrets.	See Claim 1[j].
14: The method of claim 10, further comprising rendering on the display of the electronic device the payment method types	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
stored in the electronic device, wherein said rendering comprises rendering with images, alphanumeric characters and iconography including at least one of a set comprising: a bank logo; an issuer logo; card network icons; payment network icons; a portion of the account number; and a cardholder name.	 How to Setup and Use Samsung Pay, YouTube, https://youtu.be/zR3xz6GYIzc?t=389. See also: https://www.samsung.com/us/support/answer/ANS00045170/ (under Manage Your Cards) Watches can also display information relating to bank logos and other information meeting this limitation, as shown in the following example image:
15: The method of claim 14, further comprising accepting a user selection of a payment method type for use in a transaction responsive to a user selection from a list of payment method images rendered the display and using a touch screen interface for the user selection.	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: The following internal testing is illustrative.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	 Similarly, the Samsung Pay enabled watch allows display and user selection of different payment method types:

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device
	 https://www.samsung.com/levant/support/mobile-devices/how-can-i-make-a-payment-with-my-galaxy-watch/
16: The method of claim 15, wherein the user selection is a default payment method to be used in transactions.	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:



See also <https://www.samsung.com/us/support/answer/ANS00043898/>

The default card will appear on the Watch when making a payment; a user may select this or swipe to a different card.

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device How to Pay with your Galaxy Watch  Once you're all set up, you can get to shopping. Just be sure to look for participating retailers. At checkout, press and hold the back button on your Galaxy Watch. Your default card will appear. To switch cards, simply swipe to an alternative option. Turn your display toward the contactless payment terminal and hold it close until your payment registers. See, e.g., https://www.androidauthority.com/how-to-set-up-samsung-pay-galaxy-watch-3180433/ See Claims 1[h] and 1[i]. The payment information can be entered manually or via camera recognition.
17: The method of claim 15, wherein the issuer provided payment information is selected from at least one of a set comprising: account number; card number; device account number; expiration date; card security codes; card validation values; card identification numbers; cardholder name; payment method type; merchant account; online account; an account type; a direction of transaction; the payment issuing authority; the amount of currency; the unit of currency; a funds type; cryptocurrency address; cryptocurrency key;	

Claim No.	Samsung Pay- and/or Samsung Wallet-enabled computing device	
cryptocurrency network; and card-type information.		
III. Claim 18		
Claim No.	Samsung Money by SoFi Card with a Samsung Pay- and/or Samsung Wallet-enabled computing device	
18[Pre]: A method of facilitating and authorizing an automated teller machine (ATM) transaction involving an electronic device, wherein an electronic device transacts wirelessly with an ATM, the method comprising:	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:  Pay Securely Samsung Pay replaces your actual card number with a unique digital card number. This means businesses do not see or store your full card number.  Easy to Use Confirm your identity (with a PIN, fingerprint¹, or iris scan) on your device, and tap to pay at participating businesses. Accepted in many places  In stores, simply tap your mobile device where you see the Samsung Pay logo. Contactless Symbol or card swipe at checkout. Or select the Samsung Pay logo when shopping online and in apps. Tap for ATM access  Just add your Wells Fargo Debit or Wells Fargo EasyPay[®] Card to Samsung Pay and access any Wells Fargo ATM by tapping on the Contactless Symbol². Peace of Mind  And when you use your Wells Fargo cards with a digital wallet, you will continue to have the added security of 24/7 fraud monitoring and Zero Liability protection.³ https://www.wellsfargo.com/mobile/payments/samsung-pay/ See also https://www.wikihow.com/Use-Samsung-Pay-at-an-ATM Samsung announced in 2017 that Samsung Pay would start supporting cash withdrawals even where a user did not have their ATM card with them: https://www.sammobile.com/2017/10/10/samsung-pay-cardless-cash-withdrawal-now-supported-wells-fargo-atms/ See also https://www.youtube.com/watch?v=9nl3KsQDun0 The Galaxy Watch has similar functionality. See, e.g., https://www.youtube.com/watch?v=dd83Y4uJy_o	
18[a]: providing, by the electronic device, at least one of account information;	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:	

Claim No.	Samsung Money by SoFi Card with a Samsung Pay- and/or Samsung Wallet-enabled computing device
identification; and authorization, for the ATM transaction; and, 18[b]: wherein the electronic device comprises a user interface comprising: displays; touch sensors; and buttons; and,	For example, the Samsung Pay enabled device must provide sufficient information to allow the ATM transaction to link to a user's specifically selected cash withdrawal account. See Claim 1[b] and 1[c].
18[c]: recording a user selection from the user interface of the electronic device of a user selected account from which the electronic device is operable to wirelessly convey with an ATM; and,	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:  Pay Securely Samsung Pay replaces your actual card number with a unique digital card number. This means businesses do not see or store your full card number.  Easy to Use Confirm your identity (with a PIN, fingerprint¹, or iris scan) on your device, and tap to pay at participating businesses. Accepted in many places  In stores, simply tap your mobile device where you see the Samsung Pay logo. Contactless Symbol or card swipe at checkout. Or select the Samsung Pay logo when shopping online and in apps. Peace of Mind And when you use your Wells Fargo cards with a digital wallet, you will continue to have the added security of 24/7 fraud monitoring and Zero Liability protection.³ https://www.wellsfargo.com/mobile/payments/samsung-pay/ See also https://www.wikihow.com/Use-Samsung-Pay-at-an-ATM A user can “select the relevant debit card in Samsung Pay on their device and just hold it near the ATM’s NFC terminal.” : https://www.sammobile.com/2017/10/10/samsung-pay-cardless-cash-withdrawal-now-supported-wells-fargo-atms/ See https://www.youtube.com/watch?v=9nI3KsQDun0 (starting at approximately 0:34) The Galaxy Watch has similar functionality. See, e.g., https://www.youtube.com/watch?v=dd83Y4uJy_o (starting at approximately 1:21).
18[d]: recording a user selection from the user interface of the electronic device of a user	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information:

Claim No.	Samsung Money by SoFi Card with a Samsung Pay- and/or Samsung Wallet-enabled computing device
selected account operation, wherein said user selected account operation is selected from a list of funds transfer operations; and,	At least in Korea, Samsung Pay enables performance of this step. https://www.youtube.com/watch?v=WuaiEL-x5_c (starting at approximately 3:00; showing withdrawal operations and options) On information and belief, Samsung enables the same or similar functionality in the United States as in Korea.
18[e]: wherein user input information from the user interface includes at least one of a set comprising: identification, account, amount of currency, operation and authorizing information	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: At least in Korea, Samsung Pay enables this limitation. https://www.youtube.com/watch?v=WuaiEL-x5_c (starting at approximately 2:58; showing user input information)
18[f]: wherein the identification, selection, information and authorizing operations are exchanged wirelessly between the electronic device and the ATM via NFC	On information and belief, Samsung enables the same or similar functionality in the United States as in Korea. A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: https://www.youtube.com/watch?v=9nl3KsQDum0 (starting at approx.. 0:47) https://www.youtube.com/watch?v=WuaiEL-x5_c (starting at approx. 3:05) https://www.youtube.com/watch?v=dd83Y4uJy_o (starting at approx. 1:58)
18[g]: wherein the ATM is configured for performing the user selected account operation using the identification and authorizing information	A Samsung Pay- and/or Samsung Wallet-enabled computing device, such as a phone or watch, meets this limitation based on at least the following information: Certain banks have ATMs that support withdrawals using Samsung Pay.

Claim No.	Samsung Money by SoFi Card with a Samsung Pay- and/or Samsung Wallet-enabled computing device
	 Pay Securely Samsung Pay replaces your actual card number with a unique digital card number. This means businesses do not see or store your full card number.  Easy to Use Confirm your identity (with a PIN, fingerprint¹, or iris scan) on your device, and tap to pay at participating businesses. Accepted in many places  In stores, simply tap your mobile device where you see the Samsung Pay logo, Contactless Symbol or card swipe at checkout. Or select the Samsung Pay logo when shopping online and in apps. Tap for ATM access  Just add your Wells Fargo Debit or Wells Fargo EasyPay[®] Card to Samsung Pay and access any Wells Fargo ATM by tapping on the Contactless Symbol². Peace of Mind  And when you use your Wells Fargo cards with a digital wallet, you will continue to have the added security of 24/7 fraud monitoring and Zero Liability protection.³ https://www.wellsfargo.com/mobile/payments/samsung-pay/
18[h]: wherein the identification and authorizing information exchanged wirelessly between the electronic device and the ATM comprises: statically and dynamically generated limited-use number portions	See Claim 1[o].
18[i]: wherein said static and dynamic information is combined to perform the user selected ATM operation.	See Claim 1[o].