



*"Even if you hire a patent attorney, this book is worth reading,
as it can help minimize the consulting time."*

ENTREPRENEUR MAGAZINE

8TH EDITION

**OVER 400,000 NOLO
PATENT GUIDES SOLD**

How to Make Patent Drawings

**Save Thousands of Dollars and
Do It With a Camera and Computer!**

Patent Agent Jack Lo
& Attorney David Pressman



A Patent It Yourself® Companion

More Resources from Nolo.com



Legal Forms, Books, & Software

Hundreds of do-it-yourself products—all written in plain English, approved, and updated by our in-house legal editors.



Legal Articles

Get informed with thousands of free articles on everyday legal topics. Our articles are accurate, up to date, and reader friendly.



Find a Lawyer

Want to talk to a lawyer? Use Nolo to find a lawyer who can help you with your case.





The Trusted Name

(but don't take our word for it)

"In Nolo you can trust."

THE NEW YORK TIMES

"Nolo is always there in a jam as the nation's premier publisher of do-it-yourself legal books."

NEWSWEEK

"Nolo publications... guide people simply through the how, when, where and why of the law."

THE WASHINGTON POST

"[Nolo's]... material is developed by experienced attorneys who have a knack for making complicated material accessible."

LIBRARY JOURNAL

"When it comes to self-help legal stuff, nobody does a better job than Nolo..."

USA TODAY

"The most prominent U.S. publisher of self-help legal aids."

TIME MAGAZINE

"Nolo is a pioneer in both consumer and business self-help books and software."

LOS ANGELES TIMES

8th Edition

How to Make Patent Drawings

A Patent It Yourself[®] Companion

Patent Agent Jack Lo &
Patent Attorney David Pressman



EIGHTH EDITION	JUNE 2019
Editor	DAVID GOGUEN
Illustrations	JACK LO & TERRI HEARSH
Cover Design	SUSAN PUTNEY
Production	SUSAN PUTNEY
Proofreader	ROBERT WELLS
Index	SONGBIRD INDEXING SERVICES
Printing	BANG PRINTING

Names: Lo, Jack, author. | Pressman, David, 1937- author. | Augmentation of (work): Pressman, David, 1937-. Patent it yourself.

Title: How to make patent drawings / patent agent Jack Lo and patent attorney David Pressman.

Description: 8th edition. | Berkeley, CA : Nolo, 2019. | Series: A "patent it yourself" companion | Includes index.

Identifiers: LCCN 2018058315 (print) | LCCN 2018059272 (ebook) | ISBN 9781413326345 (ebook) | ISBN 9781413326338 (pbk.)

Subjects: LCSH: Patents--United States--Drawings.

Classification: LCC T223.U3 (ebook) | LCC T223.U3 L6 2019 (print) | DDC 608.022--dc23

LC record available at <https://lcn.loc.gov/2018058315>

This book covers only United States law, unless it specifically states otherwise.

Copyright © 1997, 1999, 2001, 2005, 2007, 2011, 2015, and 2019 by Jack Lo and David Pressman. All rights reserved. The NOLO trademark is registered in the U.S. Patent and Trademark Office. Printed in the U.S.A.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior written permission. Reproduction prohibitions do not apply to the forms contained in this product when reproduced for personal use. For information on bulk purchases or corporate premium sales, please contact the Special Sales Department. Call 800-955-4775 or write to Nolo, 950 Parker Street, Berkeley, California 94710.

Please note

We believe accurate, plain-English legal information should help you solve many of your own legal problems. But this text is not a substitute for personalized advice from a knowledgeable lawyer. If you want the help of a trained professional—and we'll always point out situations in which we think that's a good idea—consult an attorney licensed to practice in your state.

Acknowledgments

I am most grateful to David Pressman for being a friend and mentor, whose generous support has been truly invaluable.

—Jack Lo

Thanks to Jack Lo for his excellent drawing skills, computer knowledge, sound ideas, and friendship. Thanks also to everyone at Nolo for their invaluable help and suggestions.

—David Pressman

About the Authors

Jack Lo is a patent agent licensed by the U.S. Patent and Trademark Office to file and prosecute patent applications. He has a bachelor's degree from the University of California at Berkeley. In his practice in Pacifica, California, he has helped hundreds of inventors patent their inventions. Unlike most patent practitioners, who handle only the written portion of a patent application, Jack also makes the formal patent drawings in addition to writing the specification and claims. Using a computer, he is adept at making purely two-dimensional drawings, as well as constructing elaborate three-dimensional computer models of inventions. The combination of writing and drawing skills enables him to produce more coherent and clearer patent applications. Jack is also an inventor with two patents, one of which he has licensed to a manufacturer and the other of which covers an ergonomic mouse he is manufacturing. In his free time, he continues to invent and enjoys collecting antiques and flying aerobatics aircraft. He is the son of the well-known artist War Ming.

David Pressman is the author of the best-selling book *Patent It Yourself*, published by Nolo. Dave has over 50 years of experience in the patent profession: as a patent examiner for the U.S. Patent Office; a patent attorney for Philco-Ford Corp., Elco Corp., and Varian Associates; a columnist for *EDN Magazine*; and as an instructor at San Francisco State University. He contributed the Patent, Trademark, and Copyright entries to the *World Book Encyclopedia*. He's also an inventor, with two patents issued. When not writing, dabbling in electronics, programming, inventing, or playing his trumpet, he practices as a patent lawyer in San Francisco. Originally from Philadelphia, he has a B.S. in electrical engineering from Pennsylvania State University. He spent his first year in law school at the University of Pennsylvania and completed his second and third years at George Washington University, where he served on the Law Review and received a Juris Doctor degree. He is also active in the general semantics and vegetarian movements. His mother, the late Mildred Phillips, wrote the lyrics for numerous published songs including Bill Haley's *Mambo Rock*. His email address is PatentItYourself@gmail.com.

Table of Contents

	Your Legal Companion for <i>How to Make Patent Drawings</i>	1
1	General Introduction to Drawing	3
	Different Drawing Views.....	4
	Perspective Foreshortening.....	10
	Drawing With Pen, Ruler, and Instruments.....	12
	Drawing With a Computer.....	14
	Using a Camera.....	16
	Summary.....	17
2	Drawing With Pen, Ruler, and Instruments	19
	Necessary Tools and Supplies.....	21
	Basic Drawing Rules and Techniques.....	24
	Tracing Photographs and Objects.....	26
	Drawing From Your Imagination.....	31
	Drawing to Scale.....	34
	Drawing Different View Angles.....	37
	Drawing Graphical Symbols.....	43
	Practice, Practice, Practice.....	46
3	Drawing With a Computer	47
	Necessary Equipment and Software.....	48
	Drawing From Scratch With 2D CAD.....	54
	Making Drawings by Tracing Photos.....	63
	Drawing With 3D CAD.....	66
	Drawing Graphical Symbols.....	72
	Retaining Your Drawings.....	72
	Summary.....	72

4	Using a Camera.....	75
	Advantages and Disadvantages.....	76
	Inventions Suited for Photography.....	76
	Photographs Must Show Invention Clearly	76
	Equipment	77
	Taking Pictures.....	77
	Summary.....	81
5	Patent Drawings in General	83
	The Drawing Requirement	84
	If No Drawing Is Submitted With a Patent Application.....	85
	Three Types of Patent Drawings.....	85
	Formal and Informal Drawings	89
	Engineering Drawings Are Not Suitable.....	90
6	Utility Patent Drawings.....	91
	Amount of Detail Required	93
	Types of Views.....	99
	Inventions With Moving Parts	116
	Shading	127
	Graphical Symbols.....	127
	Multiple Embodiments.....	141
	Line Types and Width	141
7	Design Patent Drawings.....	147
	Amount of Detail Required	148
	Views Required.....	148
	Drawings Must Show All Features	149
	Parts Behind Transparent Surfaces	152
	Movable Parts	152
	Surface Markings.....	157
	Unclaimed Matter	157
	Shading Techniques	157
	Representation of Color and Material	163
	Line Types.....	168
	Photographs.....	169
	Multiple Embodiments.....	169

8	General Standards	171
	Paper, Margins, and Sheet Numbering	173
	Black Line, Black-and-White, or Color?	178
	Arrangement and Numbering of Figures	181
	Reference Numbers	185
	Lead Lines	189
	Arrows	194
	Line Types	196
	Character of Lines	196
	Descriptive Legends	196
	Scale of Drawing	196
	Copyright or Mask Work Notice	200
	Security Markings	200
	Corrections	202
	Prohibited Elements	203
	Identification Information	204
	Drafting Symbols	204
9	Responding to Office Actions	209
	Objections and Rejections	211
	Reading the Statute and Rule Numbers	212
	Objection or Rejection Under 35 U.S.C. § 112	212
	Objection Under 37 CFR § 1.83(a) for Failure to Show Claimed Feature	215
	Objection Under 37 CFR § 1.84(p)(4) for Improper Reference Numbers	215
	Objection Under 37 CFR § 1.84(p)(5) for Missing Reference Numbers	216
	Notice of Draftsperson's Patent Drawing Review	217
	Do Not Add New Matter	224
	Correcting the Drawings	226
	Filing Corrected Drawings	227
	Summary	228

Appendix

Forms	229
Petition for Submitting Color Photographs or Drawings	
Submission of Corrected Drawings	

Index	235
--------------	-----

	Informal Utility or Design Drawing	Formal Utility Drawing	Formal Design Drawing
Sketches	✓		
Black line drawing that does not comply with all PTO rules (see Chapter 8 for rules)	✓		
Black line drawing that complies with all rules (see Chapter 8 for rules)		✓	✓
Black-and-white photo	✓		
Black-and-white photo when line drawings cannot adequately illustrate invention (no petition required)		✓	✓
Color photo or color drawing	✓		
Color photo or color drawing with granted petition (petition fee required)		✓	✓

Engineering Drawings Are Not Suitable

Inventors who finance the manufacturing and marketing of their inventions usually have a set of engineering drawings or blueprints made. Engineering drawings are created according to engineering standards, which are very different from patent drawing standards. However, they may be submitted as informal drawings, provided they clearly show every feature of the invention, and reference numerals are added

to label the parts. As discussed above, if such drawings do not show the invention clearly, they cannot be clarified later because of the rule against adding any new matter, so make sure that they are clear and understandable even if they are filed as informal drawings.

If you have computerized engineering drawings, commonly known as CAD (computer-aided drafting) drawings, you may be able to modify them into formal patent drawings. See Chapter 3 for details on CAD drawings. ●

Utility Patent Drawings

Amount of Detail Required	93
Some Details May Be Left Out	93
Better to Include Too Much Rather Than Too Little Detail	94
Dimensioning Is Usually Unnecessary	94
Idealized Parts	96
Invention Part of Larger Machine	97
Number All Parts	97
Make as Many Drawings as Necessary	97
No Changes Are Permitted After Filing	99
Types of Views	99
Orthogonal and Perspective Views	99
Exploded Views	100
Partial Views	100
Sectional Views	106
Perspective General View	106
Partial Sectional View	110
Orthogonal Versus Perspective Sectional Views	110
Line Types and Hatching	110
Enlarged Views	110
Inventions With Moving Parts	116
Shading	127
Graphical Symbols	127
Electronic Schematics	128
Block Diagrams	128
Flowcharts	134
Formulas and Tables	134
Waveforms and Plots	136

Nonstandard Symbols.....	136
Character Size.....	136
Descriptive Text.....	141
Multiple Embodiments	141
Line Types and Width.....	141

This chapter details the specific requirements of formal utility patent drawings; refer to Chapter 5 for a discussion of formal and informal drawings. Also refer to Chapter 5 and *Patent It Yourself*, our companion volume, for additional details on utility patents, including the types of inventions that qualify for them and how to prepare the written portion of the patent application.

It is very important to plan the drawings carefully before starting to draw. Some things you will need to plan are number of views from different angles, the specific angle of each view, whether to use sectional or exploded views, and how to show the movement of movable parts. The more complicated the invention, the more planning is necessary. There are many issues that must be worked out first. This chapter will help you accomplish that. Therefore, you should understand this chapter before planning the drawings.

Amount of Detail Required

The two most important requirements regarding utility patent drawings are:

- The drawings and the written description (collectively known as the “disclosure”) must be detailed and clear enough to enable a person skilled in the pertinent field to make and use your invention without undue effort or the need to invent. That is, the disclosure must be “enabling.” For example, if your invention is a medical laser, your drawings and description must be detailed enough to show a medical laser engineer how to make and use your invention. While your drawings do not have to be detailed enough for everyone to understand the invention, you should try to make them understandable to a layperson

since your examiner (and any judge who may subsequently rule on your patent) may not have a technical background in the field of your invention.

- The drawings must show all the parts or elements mentioned in the specification, including the description of the invention (technical description) and claims (legal description). For example, if the description and claims mention Parts A, B, and C, the drawings must show all three parts. (Conversely, you should give every significant part in the drawings a reference number and discuss it in the description.)

Some Details May Be Left Out

Satisfying the above requirements doesn’t mean that the drawings must show every tiny detail. As mentioned, they have to show only enough to enable “a person skilled in the pertinent field to make and use your invention.” Therefore, details that such a skilled person would know to provide may be left out. Generally, implicitly required elements, such as screws that attach parts together, need not be shown or described. If your invention is electromechanical (a mechanical device with electrical parts), you do not have to show the wires if you provide a separate electrical diagram. Some conventional elements may be illustrated with symbolic representations if their detailed illustration is not essential for an understanding of the invention. For example, if a conventional, off-the-shelf steam generator is used in a new steam cleaner, the steam generator may be simply represented by a box labeled “Steam Generator.”

Also, a conventional element may be mentioned in the description but not shown in the drawings if it is not essential for an understanding of the invention. Such an element should be followed by the note “(not shown).”

EXAMPLE 1: The invention in Illustration 6.1 includes an electrically driven roller 23 that drives a belt 21r around passive rollers 5 and 6. Instead of showing a detailed drawing of a motor connected to the driven roller, a circle is used to represent it. A simple electrical circuit (the lines and symbols connected to the right of roller 23) shows that the roller is electrically driven by a battery, which need not be numbered or mentioned in the description because it is readily understood by anyone skilled in the field. Note that the rollers are not shown to be connected to any supporting structure, which is acceptable as long as this fact is mentioned in the description. For example, you may write, “The elements shown in Fig. 1 are mounted in a suitable housing and the rollers are journaled in suitable bearings (not shown),” because such a housing is old and well known and thus will also be readily apparent to anyone skilled in the field.

EXAMPLE 2: The motor vehicle gear position indicator in Illustration 6.2 includes a housing 10 positioned above a steering column 12. Housing 10 need not be shown mounted to any supporting structure, if such structure is conventional, and the description mentions such structure. For example, “Housing 10 is mounted in a conventional instrument panel (not shown).”

Better to Include Too Much Rather Than Too Little Detail

There is no precise way to determine exactly how detailed the drawing must be. When in doubt, you should err on the side of providing more detail, because while too much detail would not hurt, too little detail definitely will because the PTO’s “no new matter rule” will not allow you to add any new technical matter to the disclosure after your application is filed.

Dimensioning Is Usually Unnecessary

Do not include the dimensions or angles of the parts in the drawing unless they are crucial to the understanding of the invention, or if they are important in distinguishing your invention from the prior art (similar but older devices). However, if you do include dimensions or angles, the PTO prefers metric units (millimeters, centimeters, and meters) over English units (inches and feet). If you prefer to include English units, you should use both metric and English—for example, “level 5 is 10 cm (2.5 inches) long.”

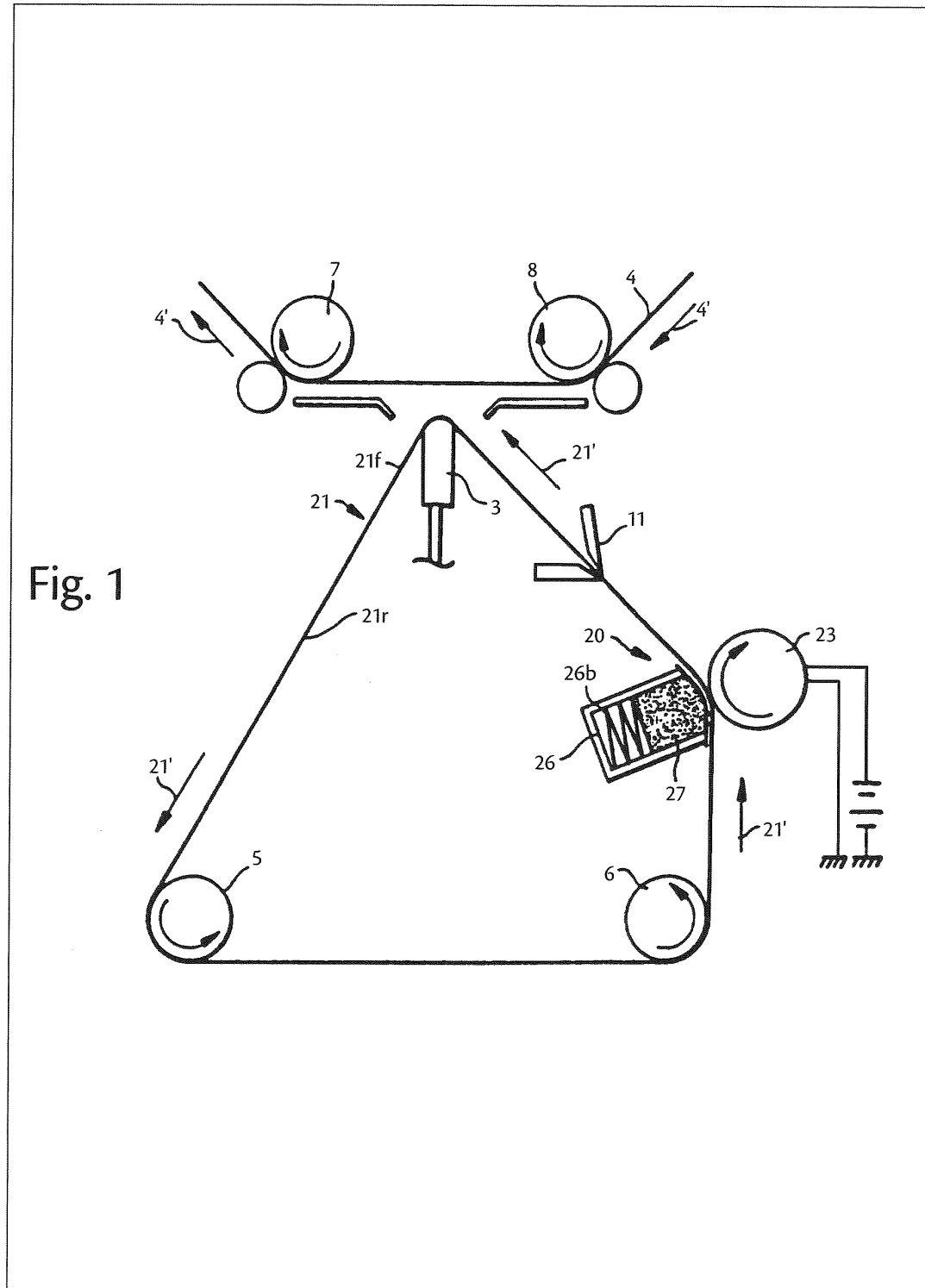


Illustration 6.1—Leaving Out Some Detail

Sectional View

As shown in Illustration 7.2, in addition to the standard views (only two shown here), a glass cover is shown in Fig. 3 in a sectional view sliced in half to illustrate its ornamental internal contour. The sectional view is necessary in this case, because the internal contour of the cover would not be clear from a bottom view, which is also required, but not shown here. A broken line with arrows must be placed on a general view (a suitable nonsectional view), such as Fig. 2 in Illustration 7.2, to indicate the sectioning plane and view direction. The number of the figure that shows the sectional view should be placed adjacent to the arrows, as shown in Fig 2. See Chapter 6 for details on sectional views.

Exploded View

A design object with parts that are separable during normal use may have such parts shown separated and independently positioned as necessary to show their internal design features, which are visible when the parts are separated, such as Fig. 2 in Illustration 7.3. In such an exploded view, a bracket must be used to “enclose” or connect the parts that belong to the same figure. Projection lines (dashed lines connecting separated parts) should not be used in design drawings. Again, in addition to the exploded view, the object must also be shown assembled in the standard views, such as Fig. 1. (Other standard views, as discussed above, are also required, but they are not shown in Illustration 7.3.)

Parts Shown Separately

Normally separable parts may also be illustrated in separate figures to show their interior design features. In Illustration 7.4, the dish and lid are shown assembled together in Fig. 1, and

the dish is shown alone in Fig. 2 to illustrate its contour that is normally covered by the lid. The description of the figures should state the fact that a part is shown separately. For example, “Fig. 1 is a front perspective view of a dish with lid showing my new design. Fig. 2 is a front perspective view of the dish, shown without the lid to illustrate interior ornamental features.” Again, as discussed above, the entire object must also be shown assembled in the other normally required views (not shown here).

Caution About Purely Functional Parts

In design patent drawings, sectional or exploded views cannot be used to show purely functional internal features that are without any aesthetic value, such as working mechanisms. Of course, if an internal functional part has an ornamental shape—for example, a stylized engine in an automobile—it may properly be shown.

Parts Behind Transparent Surfaces

Any part that is visible behind a transparent surface should be shown in solid (rather than hidden or dashed) lines, just as it would be seen in real life. The lines representing such parts should be thinner than the other lines, to distinguish them, such as in Illustration 7.5.

Movable Parts

Movable parts cannot be shown in alternate positions in design patent drawings in the same figures, but they can be shown in separate figures. If a design object has normally separable parts, use sectional or exploded views, as discussed above.

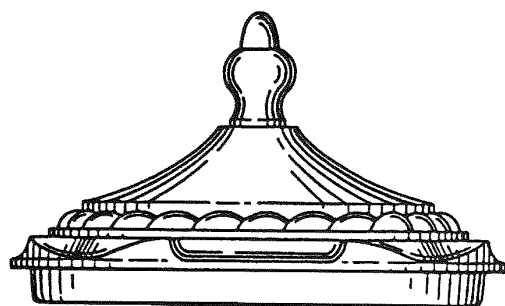


Fig. 1.

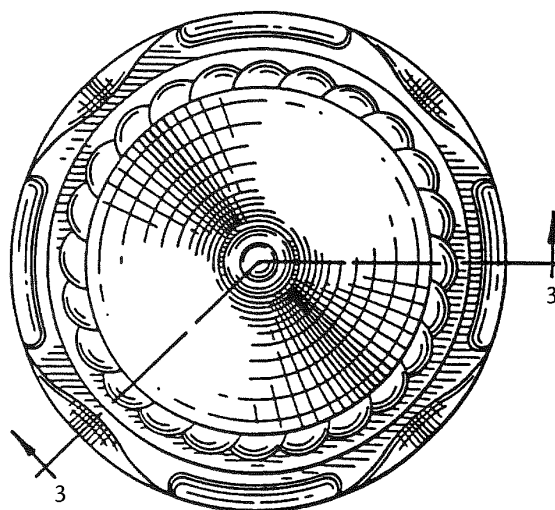


Fig. 2.

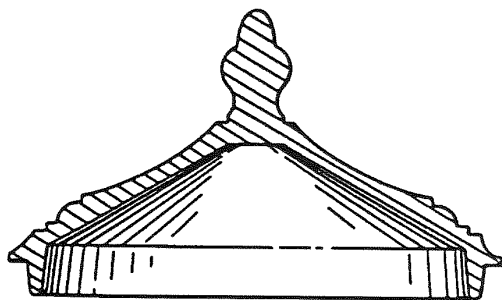


Fig. 3.

Illustration 7.2—Sectional View

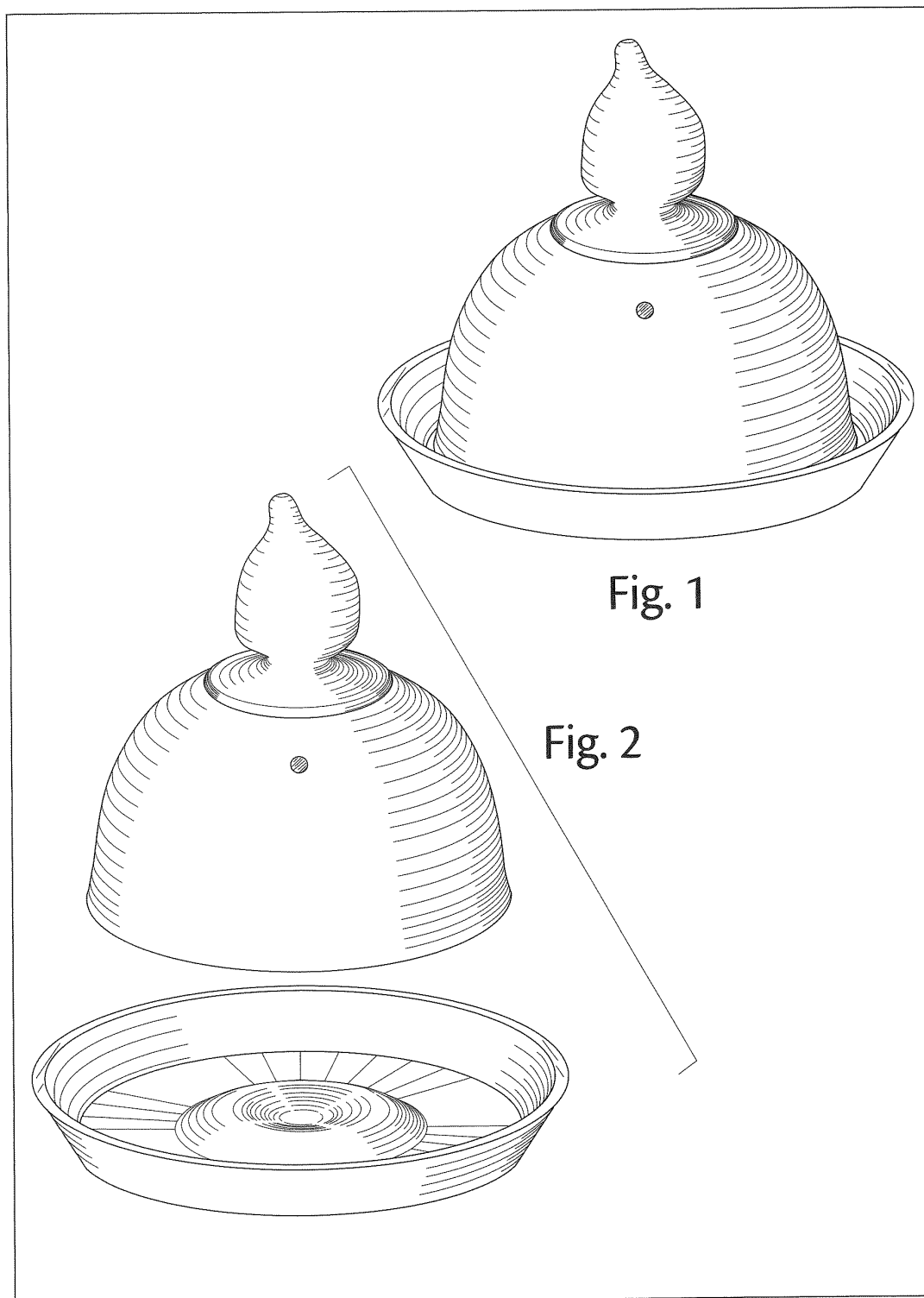


Illustration 7.3—Exploded View

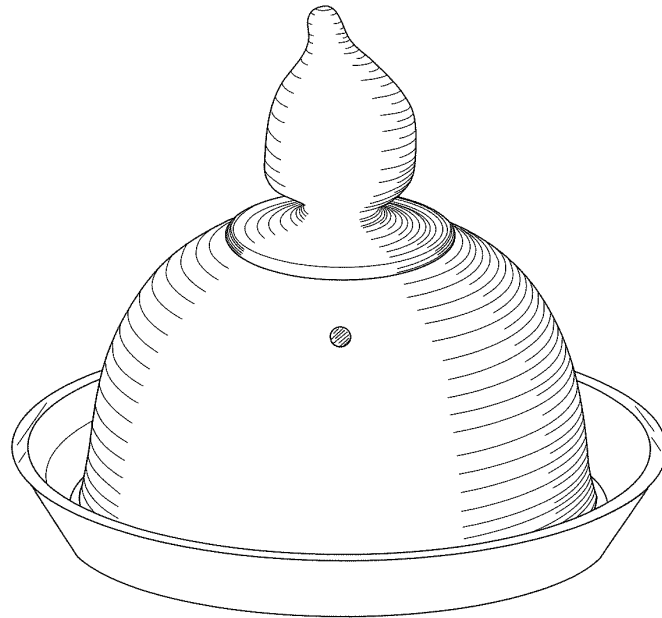


Fig. 1

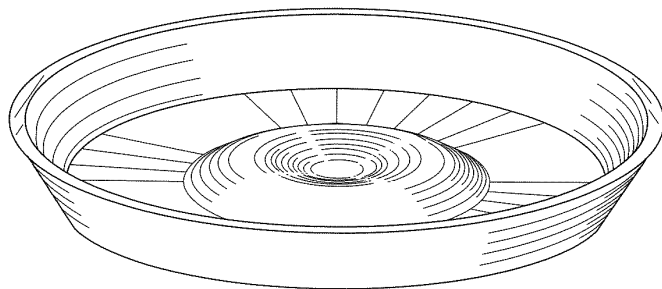


Fig. 2

Illustration 7.4—Separable Parts Shown Separately

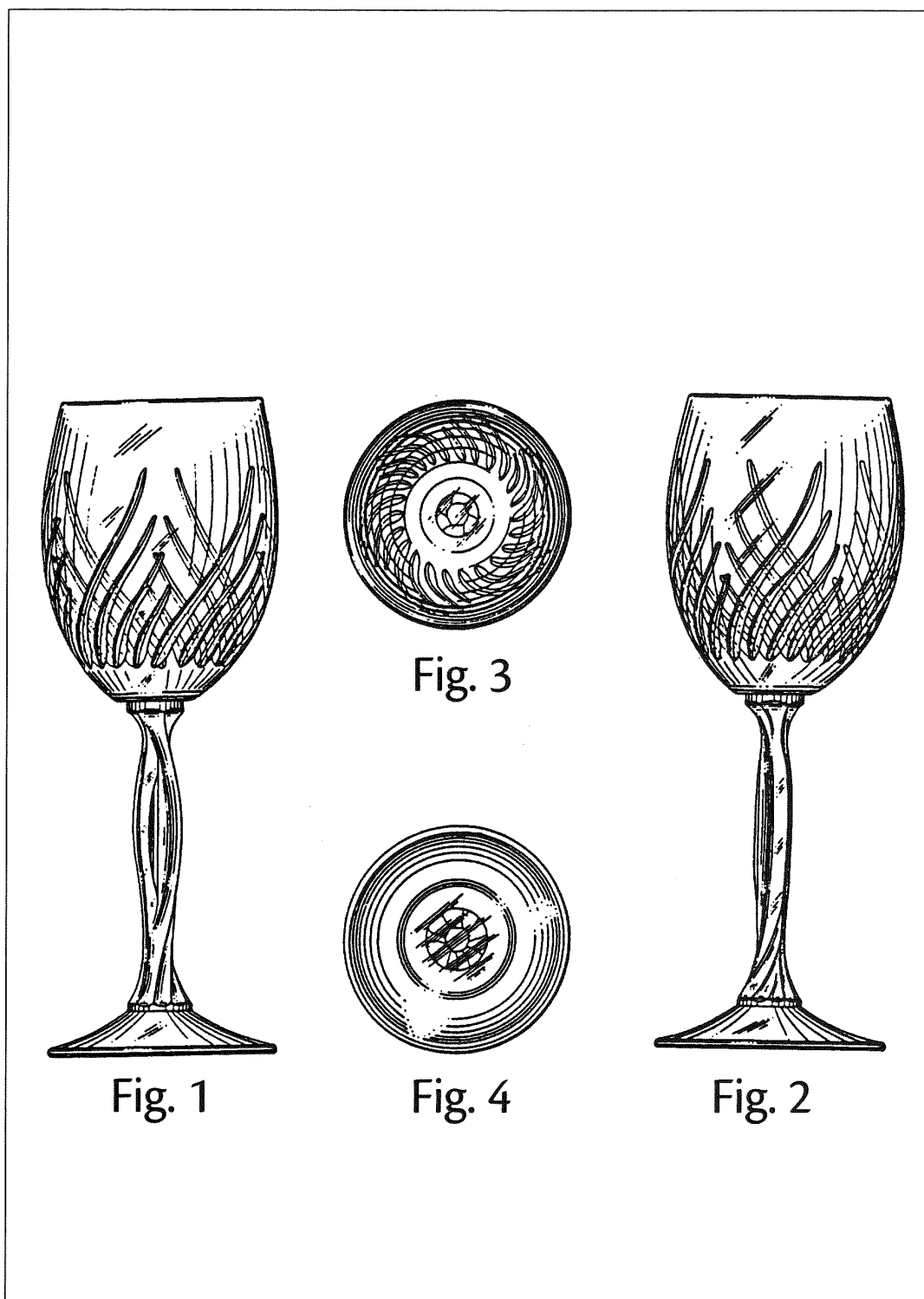


Illustration 7.5—Transparent Objects

Surface Markings

Surface markings, such as labels and logos, may be shown in continuous lines in the drawings. As discussed above, anything shown in continuous lines will be considered part of the invention. Therefore, you must consider whether such markings are an integral part of your invention before they are included. If a marking is simply one of different possible variations, such as the time displayed on a digital clock, then such marking should be shown in dashed lines. (See Chapter 8 for details on dashed lines.) If a marking is intended to be merely an example, it should be noted in the description of the figures. For example, “The marking shown in Fig. 1 is merely exemplary.” You may simply omit a marking if it is not an important part of your design.

Unclaimed Matter

Any element shown in continuous lines is considered as part of an invention, whereas any element shown in dashed or phantom lines (see Chapter 8 for details on dashed and phantom lines) is not considered to be part of the invention. Therefore, do not use dashed or phantom lines unless they represent elements that you do not wish the patent to cover (unclaimed matter)—for example, a background setting or person using the design.

In the telephone design shown in Illustration 7.6, the base unit is shown in continuous lines and the handset is shown in dashed lines. The base unit is covered by the patent, but the handset is not. The handset is shown merely to convey the design more clearly, but is actually unnecessary, because the base unit is clearly recognizable as such without it. Elements in dashed or phantom lines should be shown only when they are absolutely necessary to clearly convey the design.

Shading Techniques

Shading is the representation of surface contour and texture, and is a very important part of design patent drawings. If a drawing is filed without shading, or with inadequate shading, the examiner will object to the drawings and require you to provide new, corrected drawings. The PTO will accept new drawings that correct minor shading problems, as long as such problems do not cause significant ambiguity in the appearance of the invention. See Illustration 6.33 in Chapter 6 for an example of ambiguity caused by the lack of shading.

If shading, or its absence, causes enough ambiguity, the examiner may reject the design application as being based on inaccurate drawings. (See Chapter 9 for details on rejections by the PTO.) Such a rejection usually cannot be overcome, because it is not permissible to add any new matter (information) to an application after filing, including shading that substantially affects the shape of the design. Therefore, you must make sure that the drawings as filed clearly depict every feature of your design, including any surface contour or texture that must be illustrated by shading. Other than on the design object, shading must not be applied to anything else on the drawing, such as the background.

Linear and Stippled Shading

The shading should be applied as if the light source is to the upper left of the drawing, so that the shadows are on the right and bottom sides. The two conventionally accepted types of shading are linear and stippled. Linear shading uses parallel lines—either continuous or broken—as shown in Illustration 7.7 and Illustration 7.8, whereas stippled shading uses tiny dots, as shown in Illustration 7.9. Either type of shading is acceptable to the PTO, so choose the one you prefer. The techniques for applying shading in specific situations are discussed in the illustrations.

Fig. 1.

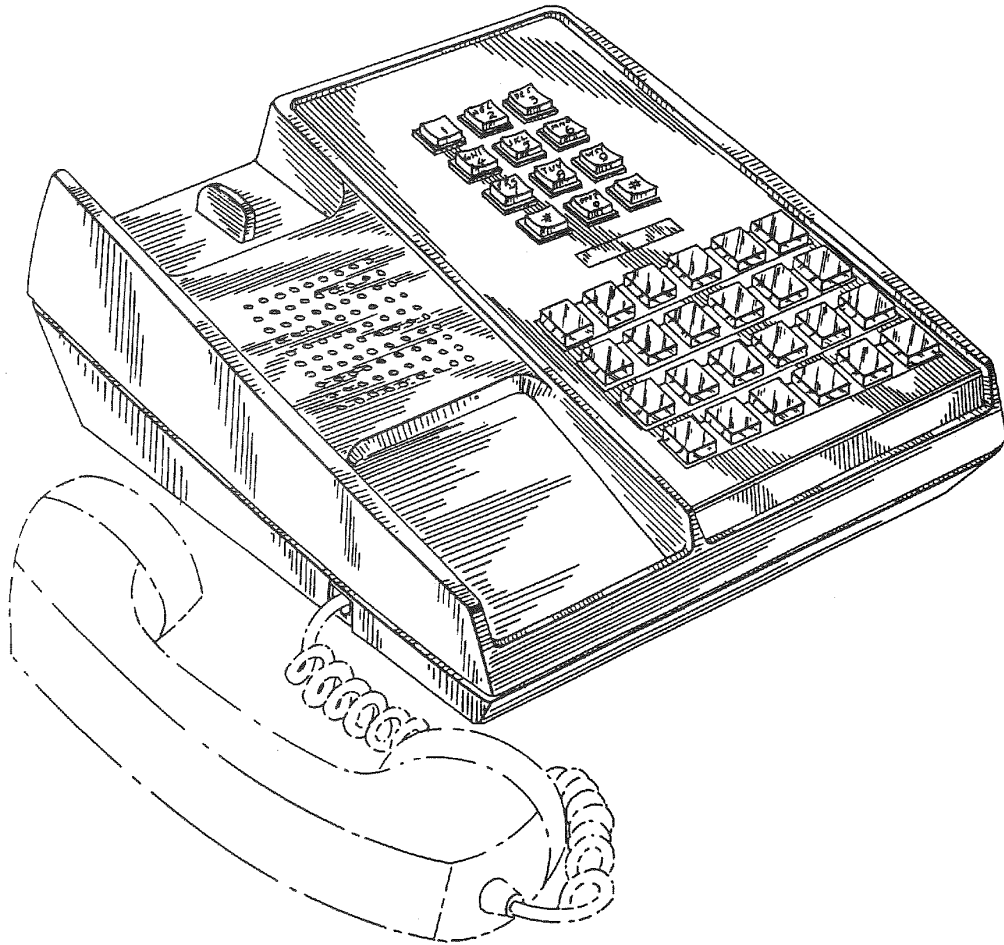
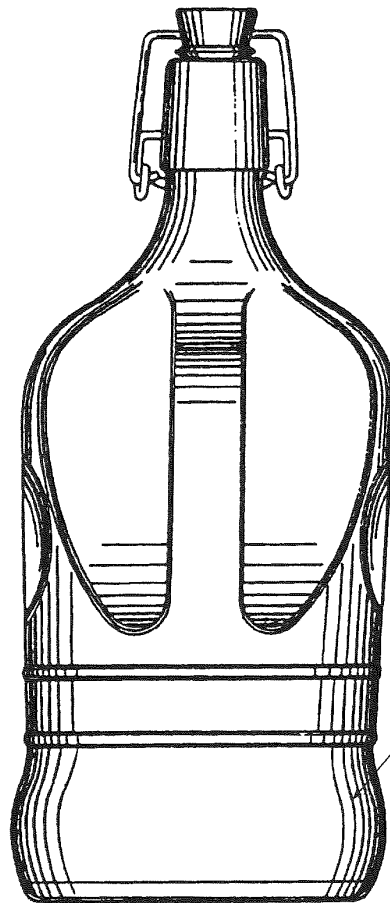


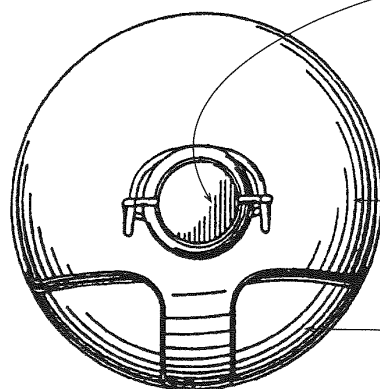
Illustration 7.6—Unclaimed Matter

Fig. 2



Shade lines gradually increase in spacing from the edge inward on a round object or curved surface.

Fig. 3



Equally spaced straight shade lines are used on lower right portion of flat top.

Shade lines gradually decrease in length from the edge inward on a domed surface.

Shading is used on lower right to indicate light source on upper left.

Illustration 7.7—Linear Shading

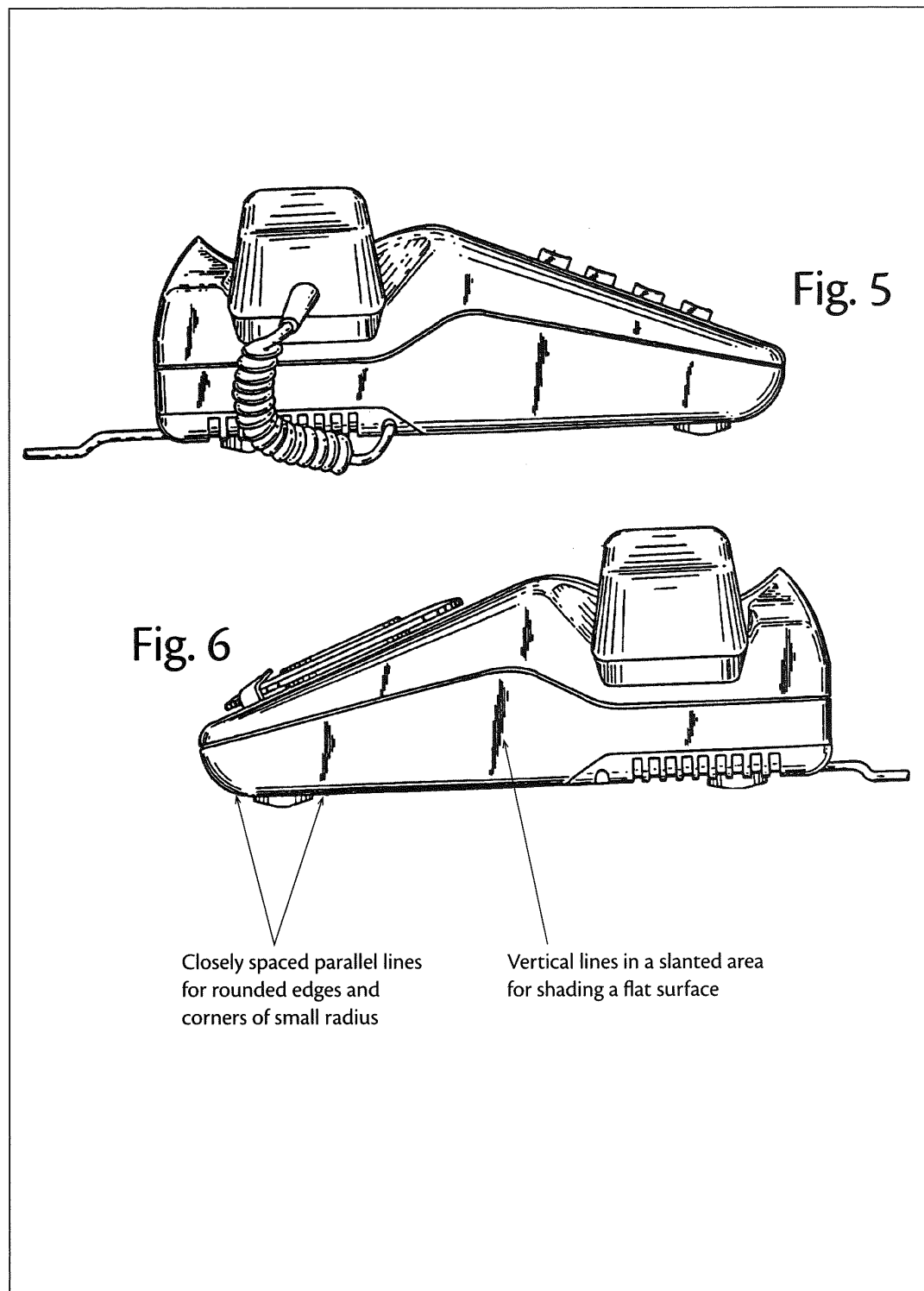


Illustration 7.8—Linear Shading

Fig. 1

Shading on inner surface
facing the right side to
indicate light source
on upper left

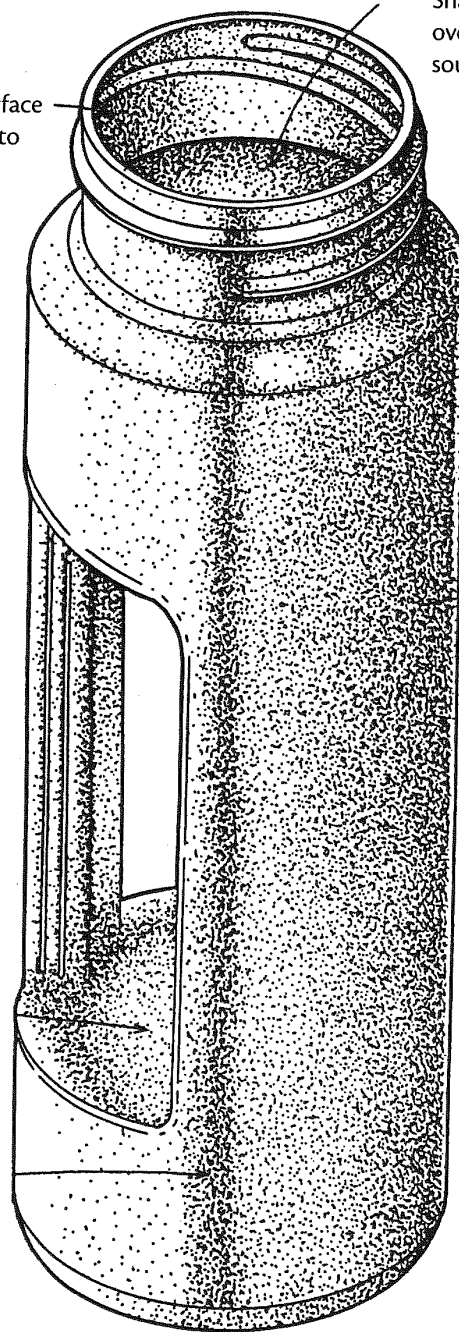
Shading on surface under
overhang to indicate light
source on upper left

Dots gradually decreasing
in density from edge
inwards on a curved
surface

Shading on right side to
indicate light source on
upper left

Evenly spaced dots
on flat surface

Dark line
actually unrealistic

**Illustration 7.9—Stippled Shading**

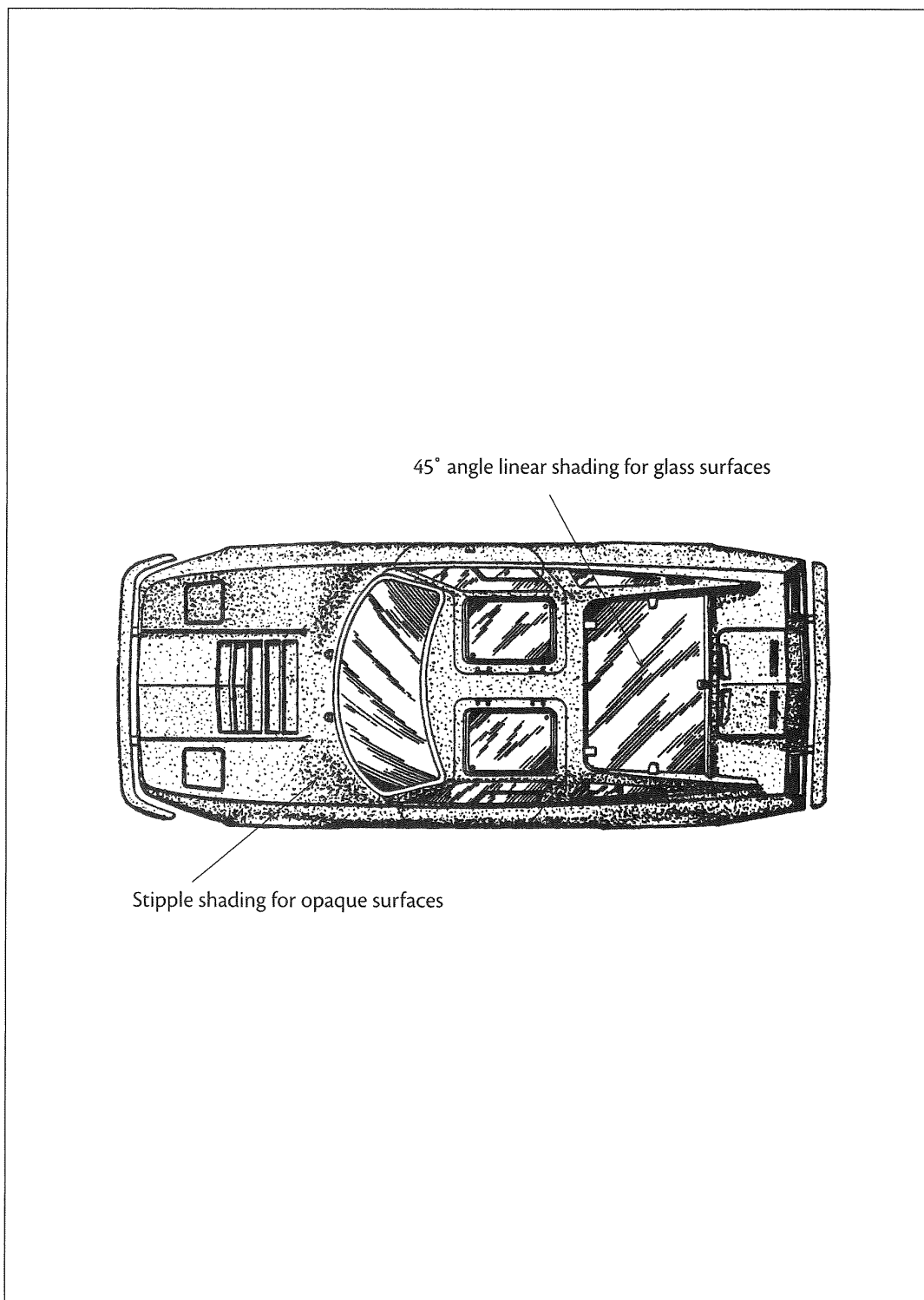


Illustration 7.10—Combined Stippled and Linear Shading

Stipple shading is normally used for representing shadows—that is, surface contour—but it may also be used for representing rough textures, such as foam, coarse fabric, or concrete. Linear shading is preferably used for depicting transparent or shiny surfaces, such as glass or polished metal. Linear and stippled shading can be combined in a drawing and used wherever suitable. For example, the body of a car can be stipple shaded, and its glass can be linear shaded, such as in Illustration 7.10. Solid black shading is not allowed, except to depict a solid black color when color is an important design feature, such as on a paint scheme of a racing car. (See below for details on the representation of color.)

Computer-Generated Shading

An illustration of a wire frame model created by a 3D CAD (computer-aided drafting) program is shown in Illustration 7.11. Most 3D CAD programs automatically apply graduated shading to a wire frame model to make it appear solid, as shown in Illustration 7.12 (2D CAD programs do not automatically apply shading). The model can be rotated to different angles and shaded again. Lines can be overlaid on the shaded illustration, as shown in Illustration 7.13. The shaded renderings can be filed as informal drawings for a design application to show the contours of the invention. Formal drawings with linear or stippled shading (see Illustrations 7.8 and 7.9) have to be filed when an application is approved. Currently no computer program can automatically apply linear or stippled shading.

Representation of Color and Material

If the novel features of your design include colors, materials, or ornamental effects that

cannot be illustrated by black line drawings, color drawings or photographs may be filed with a petition and a petition fee. If the petition is not granted, they must be replaced with black line drawings. See Chapter 8 for details on such petitions. If you must resubmit drawings, it is possible that some features may change when you convert from color to black and white. If the result is new matter, the examiner will object to the line drawings. Such an objection can be avoided by filing black line drawings and color with the original application to represent colors and materials whenever possible. The standard hatch patterns shown in Illustration 7.14 can be used to represent simple solid colors.

Illustration 7.15 shows a unique color scheme on a truck; the colors are represented by hatch patterns. The patterns are applied without regard to the object's surface contour, such as in Illustration 7.16, where the lines of the patterns are drawn straight even on a curved object. The patterns representing materials are applied in a similar way. This may seem to be a very inefficient way to represent colors, but it is necessary, because patents are printed only in black ink to minimize cost, and a color drawing or photograph converted into black and white by a photocopier usually becomes very difficult to understand.

When such patterns are used, the description of the drawings must state such fact. For example, "The drawings include standard drafting symbol patterns for representing color." If the particular colors indicated in the drawings are merely exemplary, the description of the figures should state such fact. For example, "The colors on the wheel are not limited to those specifically indicated in the drawings." Note that these special patterns are not necessary if the colors or materials of your design are unimportant.

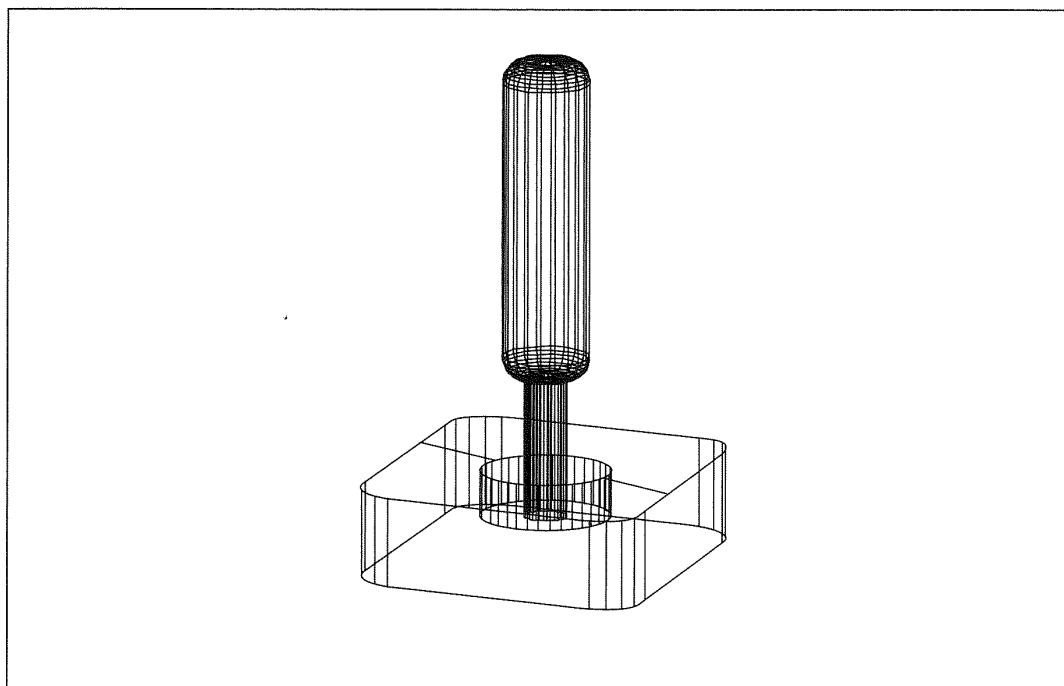


Illustration 7.11—Wire Frame 3D Model

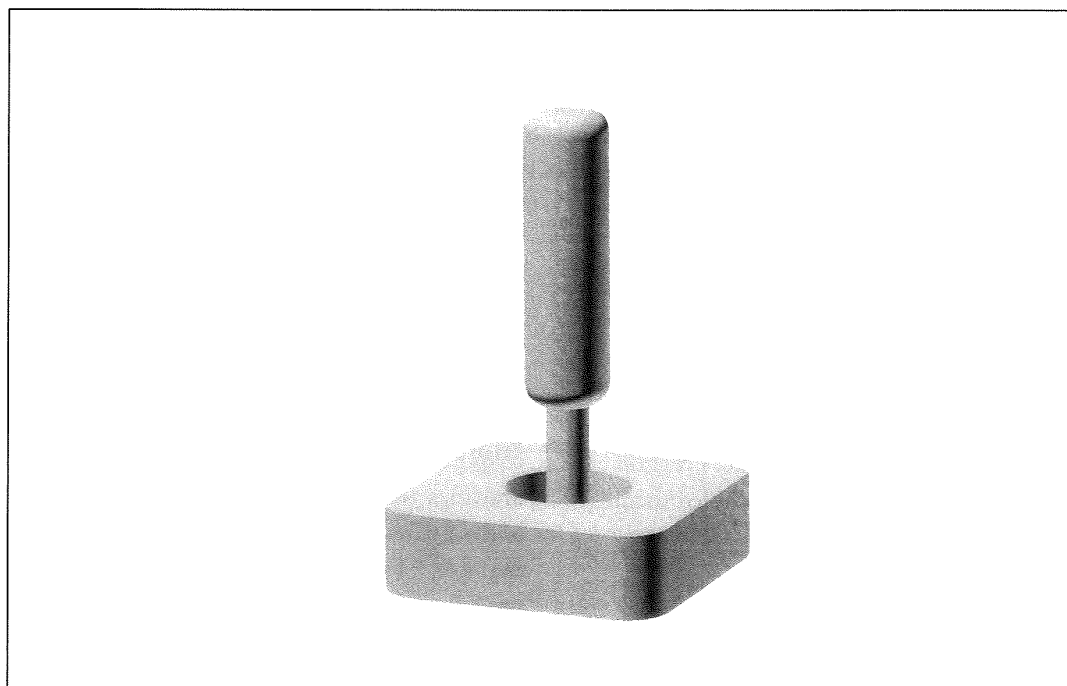


Illustration 7.12—Shaded 3D Model

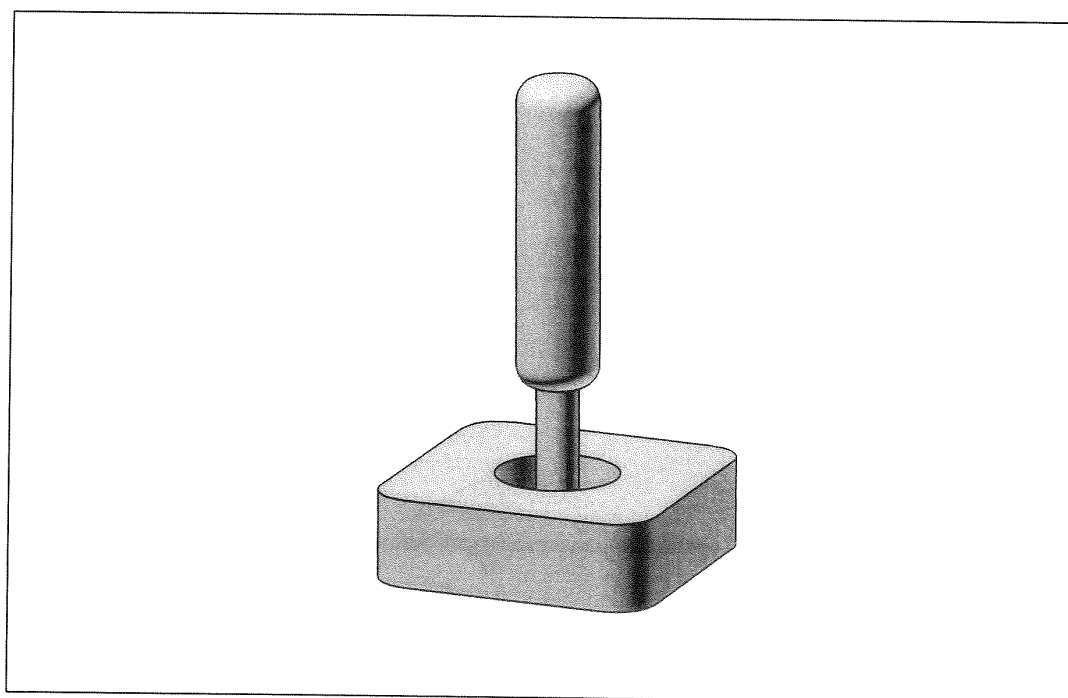


Illustration 7.13—Shaded 3D Model Overlaid With Lines

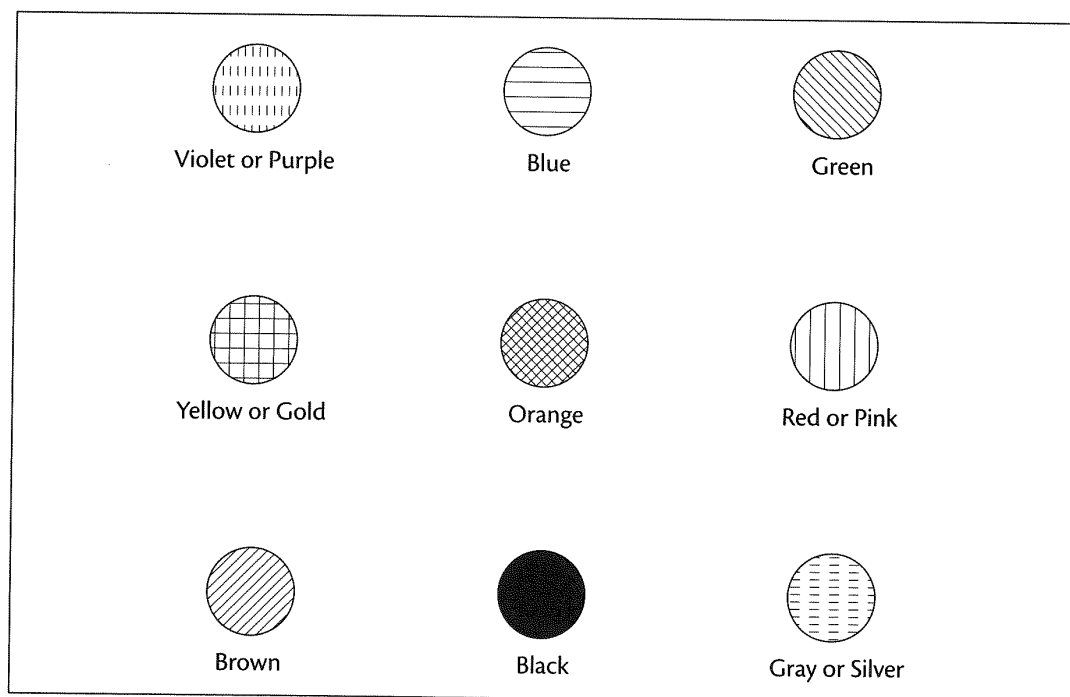


Illustration 7.14—Patterns for Representing Color

Fig. 2

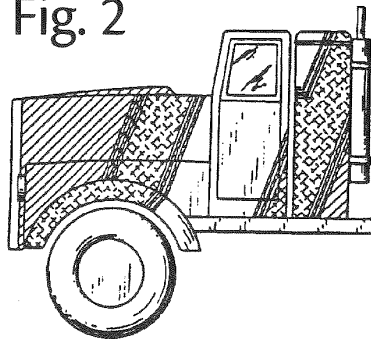


Fig. 1

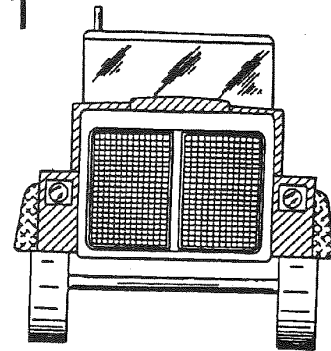


Fig. 3

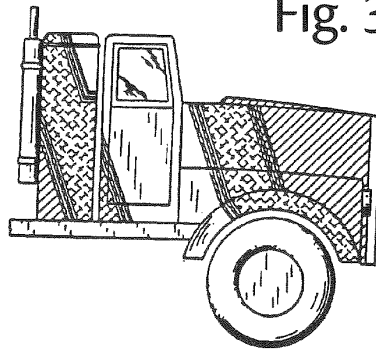


Fig. 4

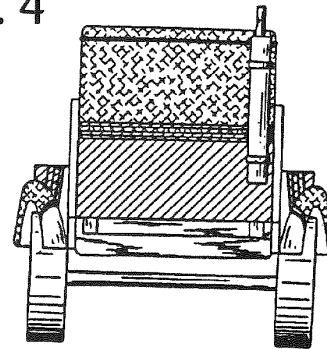


Fig. 5

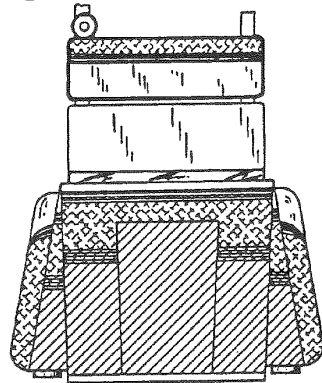


Illustration 7.15—Hatch Patterns Representing Color Scheme

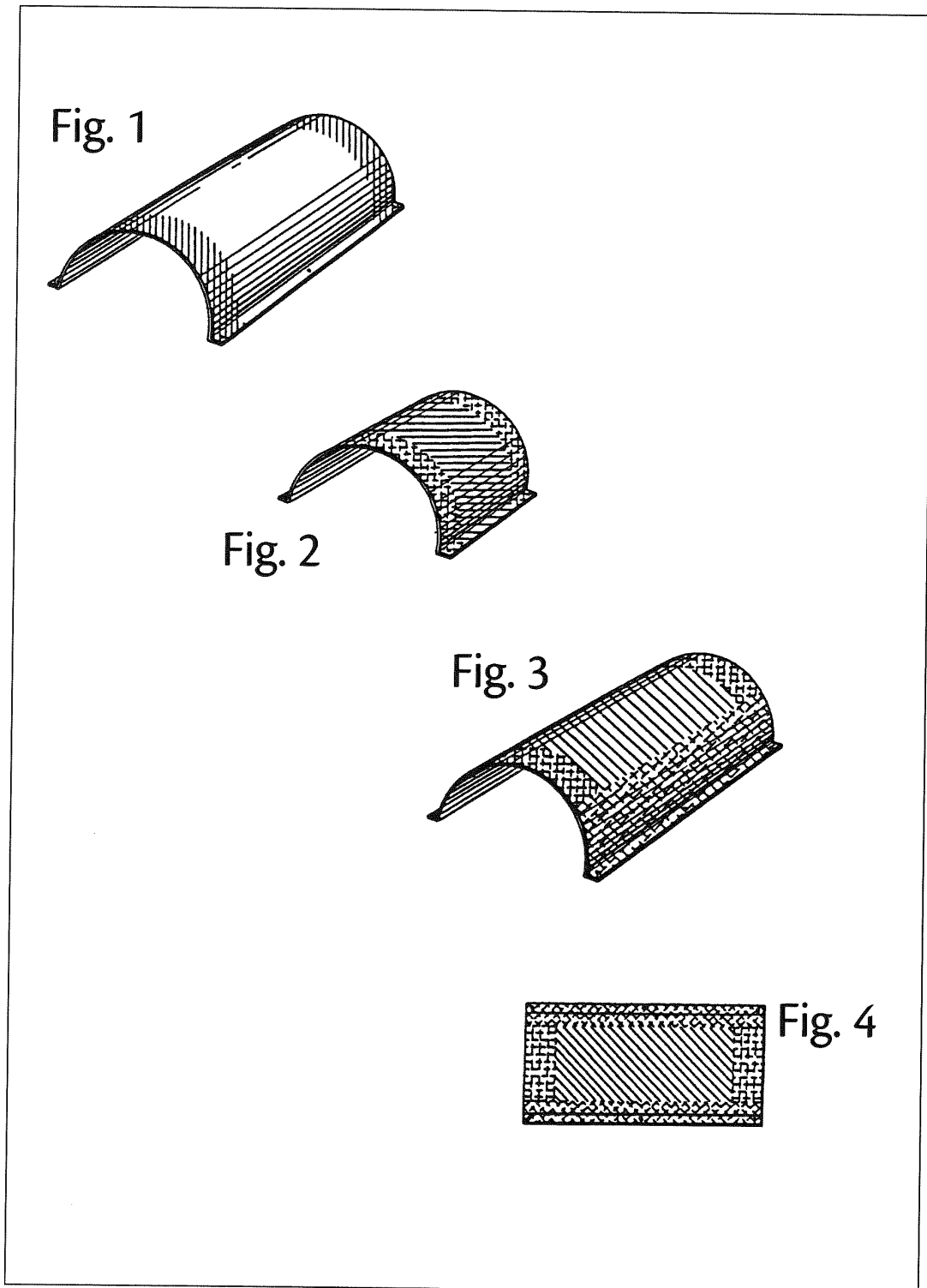


Illustration 7.16—Hatch Patterns Representing Color Scheme

"In Nolo you can trust."

NEW YORK TIMES

Save money: draw it yourself

This step-by-step guide shows you how to complete a crucial step in the patenting process—creating formal patent drawings that comply with the strict rules of the U.S. Patent and Trademark Office. Plus, it's packed with insider information and practical advice to help you get your drawings done the right way.

Whether you're applying for a utility or design patent, with *How to Make Patent Drawings*, you can:

- pick the best approach for your drawings
- choose (and use) the right tools, from pens to software
- put together effective and compliant drawings
- respond to Patent Office objections and actions
- correct rejected drawings

The 8th edition is completely updated to cover the latest changes to patent law and the newest advances in technical drawing.

Jack Lo is an inventor and licensed patent agent.

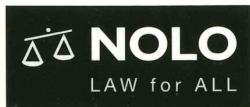
David Pressman has over 40 years of experience as a patent attorney. His book, *Patent It Yourself*, is the world's bestselling patent guide.

More at **Nolo.com**

Nolo.com's Patent, Copyright & Trademark center provides more help from the experts at Nolo:

- hundreds of valuable **articles** and **FAQs**
- useful **legal forms**
- **online services** that let you file a provisional patent application and more
- in-depth profiles of **intellectual property lawyers** in your area.

www.nolo.com



Nolo is passionate about making the law accessible to everyone. Our high-quality books, software, legal forms, and online lawyer directory have helped millions of people find answers to their everyday legal and business questions.

ISBN: 978-1-4133-2633-8



\$34.99