

# PCT Applicant's GUIDE

## THE DRAWINGS

### Article 3(2)7

#### Rule 7.1

143. When is the inclusion of drawings required in the international application? The international application must contain drawings when they are necessary for the understanding of the invention. Moreover where, without drawings being actually necessary for the understanding of the invention, the nature of the invention admits of illustration by drawings, the applicant may include such drawings and any designated Office may require the applicant to file such drawings during the national phase.

#### Rule 7.1

144. Perspectives, exploded views, sections and cross-sections, and details on a different scale are all considered to be drawings. Drawings also cover flow sheets and diagrams, such as functional diagrams and graphic representations of a given phenomenon which express the relationship between two or more parameters.

#### Rule 11.10

145. Where chemical or mathematical formulae and tables are included in the description, claims and abstract, they are not considered to be drawings and are thus not subject to the same requirements as drawings (see paragraphs 146 to 148). However, such graphic forms may be submitted as drawings, in which case they are subject to the same requirements as drawings.

#### Rule 11.10

##### 11.11

##### 11.13

146. How must the drawings be presented? Drawings must be presented on one or more separate sheets. They may not be included in the description, the claims or the abstract. They may not contain text matter, except a single word or words when absolutely indispensable. Rules 11.10 to 11.13 contain detailed requirements as to further physical requirements of drawings. Any drawing meeting those requirements must be accepted in the national phase by the designated Offices. Drawings newly executed according to national standards may not be required during the national phase if the drawings

filed with the international application comply with Rule 11. A file reference may be indicated on each sheet of the drawings as for the description (see paragraph 120).

Rule 11.2(a)

147. The drawings must be so presented as to admit of direct reproduction by photography, electrostatic processes, photo offset and microfilming, in any number of copies.

Rule 11.2(a)

11.2(b) and (e)

11.3

11.5

11.6(c)

11.12

148. Drawings must be on sheets of A4 paper (29.7 cm x 21 cm) which must be flexible, strong, white, smooth, non-shiny and durable. The sheets must be free from creases and cracks; they must not be folded. Each sheet must be reasonably free from erasures and must be free from alterations, overwriting and interlineations. Only one side of each sheet may be used. The usable surface of sheets must not exceed 26.2 cm x 17.0 cm. The sheets must not contain frames around the usable surface. The minimum margins which must be observed are: top and left side: 2.5 cm; right side: 1.5 cm; bottom: 1.0 cm.

Rule 11.10(d)

11.13(j)

149. Should figures of drawings be arranged in a particular manner? All the figures constituting the drawings must be grouped together on a sheet or sheets without waste of space, but clearly separated from each other. However, figures should not be separated by lines.

Rule 11.13(j)

150. As far as possible, all figures of the drawings should be set out upright on the sheets (that is, the short sides at the top and bottom). Where the drawings or tables cannot be presented satisfactorily in an upright position, they may be placed sideways, with the tops of the drawings or tables on the left-hand side of the sheet. Thus, a figure which is broader than it is high, may be set out so that the bottom of the figure lies parallel to and along the right-hand side of the sheet. In this case, if other figures are drawn on the same sheet, they should be set out in the same way, so that all the figures on a single sheet lie in the same position.

151. The drawings should contain as many figures as may be necessary to adequately show the claimed invention. The views may be plan, elevation, section, or perspective views; detail views of portions or elements, on a larger scale if necessary, may be used. Exploded views, with the separated parts of the same figure embraced by a bracket, to show the relationship or order of assembly of various parts, are permissible. One figure should not be placed upon or within the outline of another figure.

152. Where an invention concerns improvements to details of existing devices and machines, a general figure may be desirable to indicate where on the device or machine the improvement is situated, in order to ensure that the drawings are readily understood. If, for example, the invention relates to the fixing of an elastic diaphragm in a diaphragm pump, a figure—generally the first—may represent the entire pump, as improved by the invention, the details of which will then be given in the other figures. On the other hand, it would be unnecessary to represent the entire machine comprising this diaphragm, for example the automobile in which the diaphragm pump circulates the fuel.

153. It is sufficient to choose the views which are the most representative and contain the minimum of hidden parts, so that the object is completely and unambiguously defined by means of the smallest possible number of views. To this end, it is sometimes sufficient to replace the various views of an object by a single perspective view. The simplest view compatible with the desired result should be chosen.

Rule 11.13(i)

154. Where figures on two or more sheets form in effect a single complete figure, the figures on the several sheets must be so arranged that the complete figure can be assembled without concealing any part of any of the figures appearing on the various sheets. Partial figures drawn on separate sheets must always be capable of being linked edge to edge, that is to say, no partial figure may contain parts of another partial figure. A very long figure may be divided into several parts placed one above the other on a single sheet. However, the relationship between the different parts must be clear and unambiguous. It is therefore recommended that a smaller scale figure be included showing the whole formed by the partial figures and indicating the positions of the parts shown.

Rule 11.7

Section 207(b)

155. How must drawings be numbered? All sheets of drawings must be numbered in the center of either the top or the bottom of each sheet but not in the margin (as for the sheets of the description—see paragraph 121) in numbers larger than those used as reference signs in order to avoid confusion with the latter. For drawings, a separate series of numbers is to be used (see paragraph 53). The number of each sheet of the drawings must consist of two Arabic numerals separated by an oblique stroke, the first being the sheet number and the second being the total number of sheets of drawings. For example, "2/5" would be used for the second sheet of drawings where there are five sheets in all and "1/1" would be used in the case of a single sheet.

Rule 11.13(k)

49.5(f)

156. Different figures on the sheets of drawings must be numbered in Arabic numerals consecutively and independently of the numbering of the sheets and, if possible, in the order in which they appear. This numbering should be preceded by the expression "Fig.," whatever the language of the international application. Where a single figure is sufficient to illustrate the claimed invention, it should not be numbered and the abbreviation "Fig." should not appear. Numbers and letters identifying the figures must be simple and clear and may not be used in association with brackets, circles, or inverted commas, except as regards partial figures intended to form one complete figure, irrespective of whether they appear on one or several sheets. In this case the complete figure may be identified by the same number followed by a capital letter (for example, Fig. 7B).

157. The different figures should preferably be set out, as far as possible, on each sheet in ascending numerical order from left to right and from top to bottom. If one of two figures illustrates on a larger scale a detail from the other, each figure should be numbered separately, and if possible, consecutively.

Rule 11.13

158. How should drawings be executed? The drawings must be executed in durable, black, uniformly thick and well-defined lines and strokes. In all cases, the thickness of the lines and strokes must take into account the scale, nature, execution and perfect legibility of the drawing and of the

reproductions. All lines in the drawings must, ordinarily, be drawn with the aid of a drafting instrument, except those which by their nature do not permit the use of such instruments, for example, irregular diagrams and ornamental structures.

159. May lines of different thicknesses be used in the same drawing? Lines and strokes of different thicknesses may be used in the same drawing where different thicknesses have a different meaning. One could, for instance, use:

- a continuous thick line for edging and outlining views and cross-sections;
- a continuous thin line for leading lines, hatching, outlining parts of adjoining elements, fictitious lines of intersection of surfaces connected by curved or rounded edges;
- a continuous thin line drawn freehand for delimiting views, part sections or interrupted views;
- a thin broken line made up of short dashes for hidden edges and contours;
- a dot-dash thin line for axes and planes of symmetry, extreme positions of movable elements, in front of a cross-section;
- a thin line terminating in two thick lines for outlines of cross-sections.

160. How should leading lines be shown? Leading lines, that is, lines between the reference signs and the details referred to, may be straight or curved and should be as short as possible. They must originate in the immediate proximity of the reference sign and extend to the feature indicated. Leading lines for certain reference signs may be omitted. Reference signs of this type, which are not connected to anything, will then indicate the surface or cross-section on which they are placed. In such cases the reference sign may be underlined to make it quite clear that the line has not been left out by mistake. Leading lines must be executed in the same way as other lines in the drawing.

161. Arrows may be used at the end of the leading lines provided that their meaning is clear. They may indicate a number of points:

- (a) a freestanding arrow indicates the entire section towards which it points;
- (b) an arrow touching a line indicates the surface shown by the line looking along the direction of the arrow;
- (c) arrows may also be used in appropriate cases to show the

direction of movement.

Rule 11.13(b)

162. How are cross-sections to be represented? In making and representing cross-sections, certain conditions must be observed with regard to the indication and identification of the figures concerned and how they are to be represented, as more fully explained in paragraphs 163 and 164.

163. Where a figure is a cross-section on another figure, the latter should indicate the position of the section and may indicate the viewing direction by arrows at each end. In addition, in order to allow each sectional figure to be quickly identified, especially where several cross-sections are made on the same figure, each end of the cross-section line should be marked on the diagram with the same single Arabic or Roman numeral which identifies the figure in which the section is illustrated. A cross-section represents that part of an object which is situated on a cutting surface. In industrial drawings, the cross-section is that part of the object which is behind the cutting surface from the point of view of the person looking at it. Cutting surfaces are generally plane surfaces and if they are not, they must be defined precisely. Cross-sections must always follow the cutting surface, whatever it may be.

164. A cross-section must be set out and drawn in the same manner as a normal view whose parts in cross-section are hatched with regularly spaced parallel oblique strokes, the space between strokes being chosen on the basis of the total area to be hatched. Hatching should not impede the clear reading of the reference signs and leading lines. Consequently, if it is not possible to place references outside the hatched area, the hatching may be broken off wherever reference signs are inserted. Certain types of hatching may be given a specific meaning. The hatching should be at a substantial angle to the surrounding axes or principal lines, preferably 45°. The various parts of a cross-section of the same item should be hatched in the same manner. The hatching of juxtaposed different elements should be angled in a different way. In the case of large areas, hatching can be confined to an edging drawn around the inside of the outline of the area to be hatched.

Rule 11.13(c)

165. What should be the scale of figures of the drawings? The scale of the figure should be such that all the essential

details can be clearly distinguished in a linear reduction in size to two-thirds. In exceptional cases, where required, the scale of the drawing may be graphically represented. Indications such as "actual size" or "scale " on the drawings or in the description, are not permitted, since these lose their meaning with reproduction in different format.

Rule 11.13(g)

166. Each element of each figure must be in proportion to each of the other elements in the figure, except where the use of a different proportion is indispensable for the clarity of the figure. As a preferred alternative to a difference in proportion within one figure for the purpose of achieving the necessary clarity, a supplementary figure should be added giving a larger scale illustration of the element of the initial figure. In such cases, it is recommended that the enlarged element shown in the second figure be surrounded by a finely drawn or "dot-dash" circle in the first figure pinpointing its location without obscuring the figure.

Rule 11.13(e)

167. How should numbers, letters, reference signs and like indications be presented and applied to drawings? Numbers, letters and reference signs and any other data given on the sheets of drawings, such as the numbering of figures, and of the sheets of the drawings, acceptable text matter, graduations on scales, etc., must be simple and clear, and not used in association with any brackets, inverted commas, circles or outlines whatsoever. Signs indicating minutes, seconds or degrees are permitted. Numbers, letters and reference signs should be laid out in the same direction as the diagram so as to avoid having to rotate the sheet. Such numbers, letters and reference signs should not be so placed in the closed and complex parts of the drawings as to interfere with a thorough comprehension of the same, and therefore should rarely cross or mingle with the lines. As a general rule, numbers, letters and reference signs should be placed as closely as possible to the part in question.

Rule 11.13(h)

168. A minimum size of 0.32 cm is required for all numbers and letters used on the drawings so that their reduction in size to two-thirds remains easily legible. The Latin alphabet should normally be used for letters. The Greek alphabet is to be accepted, however, where it is customarily used, for example, to indicate angles, wavelengths, etc.

Rule 11.13(l)

169. Reference signs are to be used in a manner which is consistent as between the description, claims and drawings. In particular, reference signs not mentioned in the description must not appear in the drawings, and vice versa. Features of a drawing should not be designated by a reference sign in cases where the feature itself has not been described. This situation may arise as a result of amendments to the description involving the deletion of pages or whole paragraphs. One solution would be to delete reference signs on the drawing which have been deleted in the description. Where for any reason a figure is deleted, all reference signs relating solely to that figure appearing in the description and claims should also be deleted.

Rule 11.13(m)

170. The same features, when denoted by reference signs, must, throughout the international application, be denoted by the same signs. However, where several variants or embodiments of a claimed invention are described, each with reference to a particular figure, and where each variant contains features whose function is the same or basically the same, the features may, if this is indicated in the description, be identified by reference numbers made up of the number of the figure to which it relates followed by the number of the feature, which is the same for all variants, so that a single number is formed. For example, the common feature "15" would be indicated by "115" in Fig. 1, while the corresponding feature would be indicated by "215" in Fig. 2, thereby allowing the individual feature and the figure on which it is to be considered to be indicated at the same time. Complex cases involving many pages of drawings may be made easier to read if, when the individual variants or embodiments are described with reference to particular groups of figures, the common reference sign is prefixed by the number of the particular variant or embodiment to which it relates; however, this should, if used, be explained in the description.

Rule 11.11

171. May drawings contain text matter? The drawings must not contain text matter, except a single word or words when absolutely indispensable, such as "water," "steam," "open," "closed," "section on AB" and in the case of electric circuits and block schematic or flow sheet diagrams, a few short catch words indispensable for understanding. Any words used must be so placed that if translated, they may be pasted

over without interfering with any lines of the drawings.

Rule 10.1(d) and (e)

172. May symbols be used in drawings? Known devices may be illustrated by symbols which have a universally recognized conventional meaning and are generally accepted in the art provided no further detail is essential for understanding the subject matter of the claimed invention. Other signs and symbols may be used provided that they are not likely to be confused with existing conventional symbols, that they are readily identifiable, that is, simple, and providing that they are clearly explained in the text of the description. Different types of hatching may also have different conventional meanings as regards the nature of a material seen in cross-section.

173. Is the use of shading permitted? The use of shading in figures is allowed provided this assists in their understanding and is not so extensive as to impede legibility. Shading may, for instance, be used to indicate the shape of spherical, cylindrical, conical elements, etc. Flat parts may also be lightly shaded. Such shading is allowed in the case of parts shown in perspective but not for cross-sections. Only spaced lines may be used for shading, not fully blacked out areas. These lines must be thin, as few in number as possible and they must contrast with the rest of the drawings.

174. May a photograph be presented instead of a drawing? The PCT makes no provision for photographs. Nevertheless, they are allowed where it is impossible to present in a drawing what is to be shown (for instance, crystalline structures). Where, exceptionally, photographs are submitted, they must be black and white, must be on sheets of A4 size, and must respect the minimum margins (see paragraph 159) and admit of direct reproduction. Color photographs are not accepted, nor are color drawings. Photographs are retained by the International Bureau as part of the record copy.

Rule 11.13(n)

175. May a list of reference signs used in the drawings be included in the description? In the case of international applications dealing with complex subjects and incorporating a large number of drawings, a separate sheet listing all reference signs may be included at the end of the description as a part thereof. This list may take whatever form is appropriate and contain all the reference signs together with

the designation of the features which they denote. This method could have the advantage of allowing an easier reference to the meaning of the various reference signs employed and understanding of the drawings.

Rule 91.1

176. How can obvious errors in the drawings be rectified? The procedure for rectification of obvious errors is explained in paragraphs 443 to 448. The omission of an entire sheet of drawings cannot be rectified without affecting the international filing date (see paragraphs 238(b) and 239). Changes other than the rectification of obvious errors are considered amendments (see paragraph 176).

Article 28

34(2)(b)

41(1)

177. Can the drawings be amended during the international phase? The drawings can be amended during the international phase only if the applicant files a demand for international preliminary examination (see paragraph 322). The drawings can also be amended during the national phase (see Volume II).

178. As regards the figure or, exceptionally, figures to accompany the abstract, see paragraph 186.