

July 25, 1939.

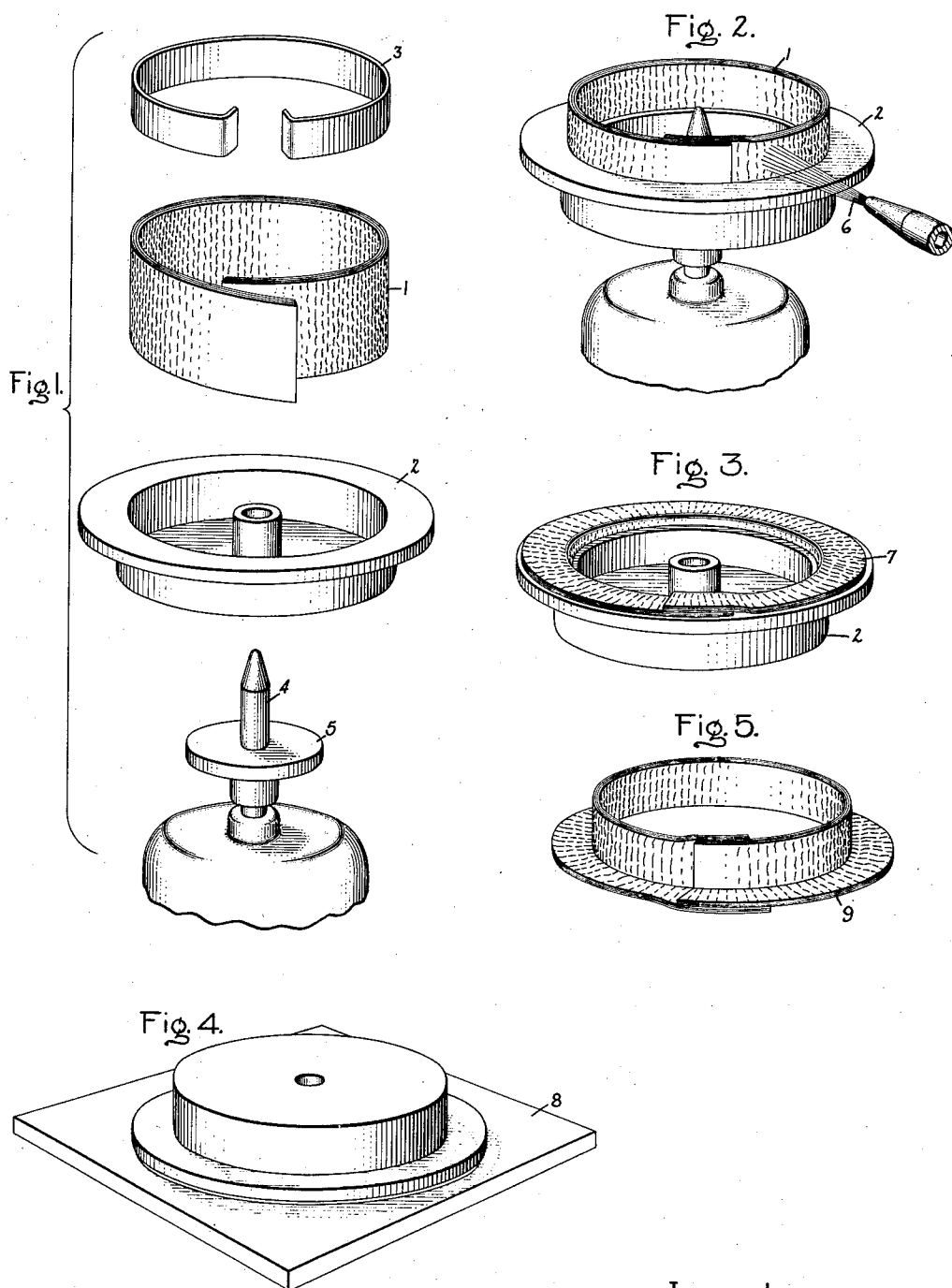
J. J. VIENNEAU

2,167,539

METHOD OF MAKING FLANGED CYLINDERS

Filed Dec. 28, 1937

2 Sheets-Sheet 1



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Fig. 6.

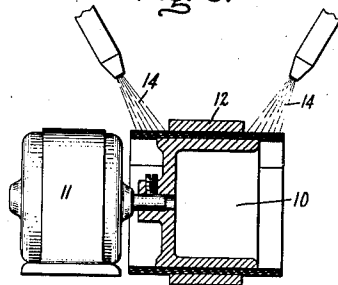


Fig. 7.

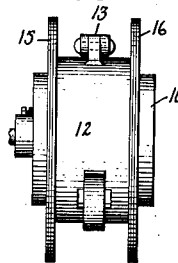


Fig. 8.

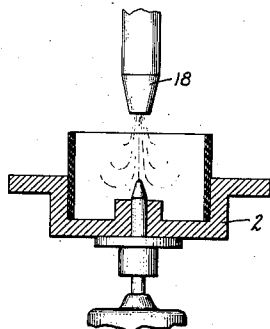


Fig. 9.

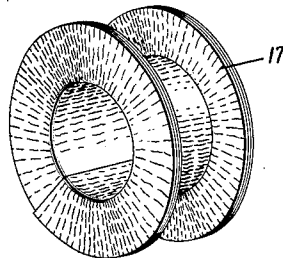
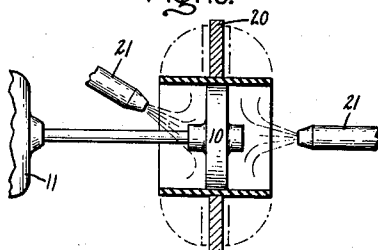


Fig. 10.



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UNITED STATES PATENT OFFICE

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METHOD OF MAKING FLANGED CYLINDERS

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Application December 28, 1937, Serial No. 182,075

6 Claims. (Cl. 18—56)

My invention relates to the formation of flanged hollow cylindrical members, that is, members having a hollow cylindrical portion which merges into one or more flange portions. Such members have many uses such, for example, as the insulating spools or collars employed in electrical windings, protective covers for gaskets, etc. It is the object of my invention to provide an improved method of constructing such flanged members which is simple, rapid, efficient and inexpensive.

My invention will be better understood from the following description taken in connection with the accompanying drawings, and its scope will be pointed out in the appended claims.

Referring to the drawings, Fig. 1 is an exploded view of apparatus by which the first step of my invention may be carried out; Fig. 2 illustrates the step of rotating the material to be given a flange and simultaneously rendering it pliable; Fig. 3 shows the result of the last mentioned step; Fig. 4 shows how a flanged cylinder may be dried to give it a desired form; Fig. 5 shows the finished article; Fig. 6 illustrates how a double flanged cylinder may be formed; Fig. 7 shows the result of the operation represented by Fig. 6; Fig. 8 shows a modification of Fig. 2; Fig. 9 shows a complete two-flanged cylinder, and Fig. 10 shows a modification.

In Fig. 1, I have shown at 1 a strip of material such as a plurality of superposed layers of crepe paper bent in the form of a cylinder with the corrugations extending in an axial direction. The cylinder thus formed is inserted in the form 2 from which a part, which in the present case is substantially half of the cylinder, projects above the form. For securing the cylinder against accidental displacement when the form is rotated, I preferably employ the split ring 3 of resilient material which may be inserted in the cylinder after it has been contracted to hold the cylinder snugly against the inside walls of the form 2. The form, which is provided with a central opening, is then placed on the motor shaft 4 until it rests upon the flange 5 thereof and the motor is energized. Due to the weight of the form, there is sufficient friction with the flange of the motor shaft to cause the form quickly to come to the speed of the motor shaft.

While it is thus rapidly rotating, that portion of the cylinder 1 which projects above the form is rendered pliable. If the material forming the cylinder 1 is of crepe paper, it may be made pliable by being moistened and such moistening may be effected readily by directing a spray or

small stream of water 6 against it. Since the paper quickly soaks up the water, thereby becoming soft and pliable, the projecting portion of the cylinder then turns outwardly under the action of the centrifugal force and takes a radial position forming the flange 7, the corrugations in the material permitting the necessary expansion thereof. Inasmuch as any surplus water on the flange will be thrown off due to the rapid rotation thereof, the flange will soon dry if it is allowed to continue to rotate. However, it may be found more expedient to remove the form from the motor shaft as soon as the flange is formed and place it in an inverted position on the hot plate 8, as shown in Fig. 4, which plate may be heated by any suitable means, not shown. This manner of drying the flange has the additional advantage that by reason of the weight of the form the flange is held flat until it becomes completely dry when it will retain its flat form. Upon removal of the flanged cylinder thus formed from the hot plate and from the form its appearance may be like that shown at 9 in Fig. 5.

When it is desired to form a flange on both ends of a cylinder the cylinder may be mounted upon a mandrel such as shown at 10 in Fig. 6 which is arranged to be rapidly rotated by the motor 11. For retaining the central portion of the cylinder, I have shown the two-part band 12, the two parts being suitably hinged together as shown at 13 and clamped to retain the cylinder and to facilitate removal of the band after the flanges are formed. After the cylinder has been brought up to speed by the motor the projecting ends are rendered pliable which in the case of a crepe paper cylinder may be effected by directing thereon sprays or streams of water 14. The end portions of the cylinder thereupon flare outwardly due to the centrifugal force as already described and form the flanges shown at 15 and 16 of Fig. 7. The double flanged cylinder after becoming dry and after the band 12 and the arbor 10 have been removed will appear as shown at 17 in Fig. 9.

My invention is applicable not only to materials which are rendered pliable by moistening them but also to other materials, such for example as cellulose acetate, which are rendered pliable by the application of heat. In Fig. 8 I have shown how a cylinder having an integral flange may be formed of such a material. In this case, a hollow cylinder may be formed of a single strip of the material which may be bent to form a single turn preferably with overlapping ends

or may be wound up to provide a number of layers. If desired, one may start with a solid walled cylinder of the material. The cylinder is mounted inside of the form 2 as shown at Fig. 8, with a portion thereof extending above the form and while it is being rapidly rotated heat may be applied, for example by the gas burner 18. By reason of the softening of the material by the heat the portion extending above the form stretches and turns outwardly until it forms a flange lying against the form in the same manner and as has been described above in connection with Figs. 1 to 3 inclusive. As soon as the heat is removed and the material begins to cool it regains its former stiffness, the rotation preferably being continued until the desired cooling has taken place. Obviously, if it is desired to produce a cylindrical member having a flange at each end such as shown in Fig. 9, the cylinder may be rotatably mounted and secured as shown by Fig. 6 in which case the end portions may be heated by directing a hot blast or flame against them instead of jets of water.

Instead of merely producing a cylinder having integral flanges at the ends adapted subsequently to receive or support something, I may, in certain cases, desire to construct such an article by forming it around some other article such as a gasket thereby producing a protective covering for the article. Such a protective covering may be produced in a manner somewhat similar to that shown by Fig. 6 but illustrated more particularly by Fig. 10. In this case the gasket takes the place of the divided ring 12, the two flanges being formed on opposite sides of the gasket as a result of the softening effect of heat applied thereto by the two burners 21 and the centrifugal force, so that upon removal from the arbor 10 one obtains a gasket with an integral protective covering on the two sides and the inner surface. Such a protected gasket is of particular use in applications where the gasket would be injured by the material passing therethrough.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. The method of forming a flange on a hollow expandible cylinder of material rendered pliable by moisture which comprises rapidly rotating said cylinder axially while supported externally for a part of its length and moistening an unsupported part of the cylinder.

2. The method of forming a flange on a crepe paper cylinder having the corrugations of the paper extending axially which comprises rapidly rotating the cylinder while externally supported for a part of its length and directing a stream of water on an unsupported part of the cylinder.

3. The method of forming a flanged cylinder from a strip of crepe paper which comprises bending the strip into cylindrical form with the corrugations of the paper extending axially, rapidly rotating it axially while supported externally for a part of its length and moistening the part thereof which is unsupported.

4. The method of forming a hollow cylinder with integral flanges at opposite ends thereof from a strip of material which comprises bending the strip into cylindrical form, rapidly rotating it axially while supporting it externally intermediate its end portions and applying to the unsupported end portions while rotating an agent for rendering said material pliable.

5. The method of forming a protective cover on a gasket from material rendered pliable by the application of a softening agent which comprises placing a hollow cylinder of the material within the gasket with the ends projecting therefrom, rapidly rotating the gasket and cylinder axially and simultaneously applying the softening agent to the projecting ends.

6. The method of forming a protective cover on a gasket from material softened by heat which comprises placing a hollow cylinder of the material within the gasket with the ends projecting therefrom, rapidly rotating the gasket and cylinder axially and simultaneously applying heat to the projecting ends whereby they bend outwardly to form flanges at opposite sides of the gasket.

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