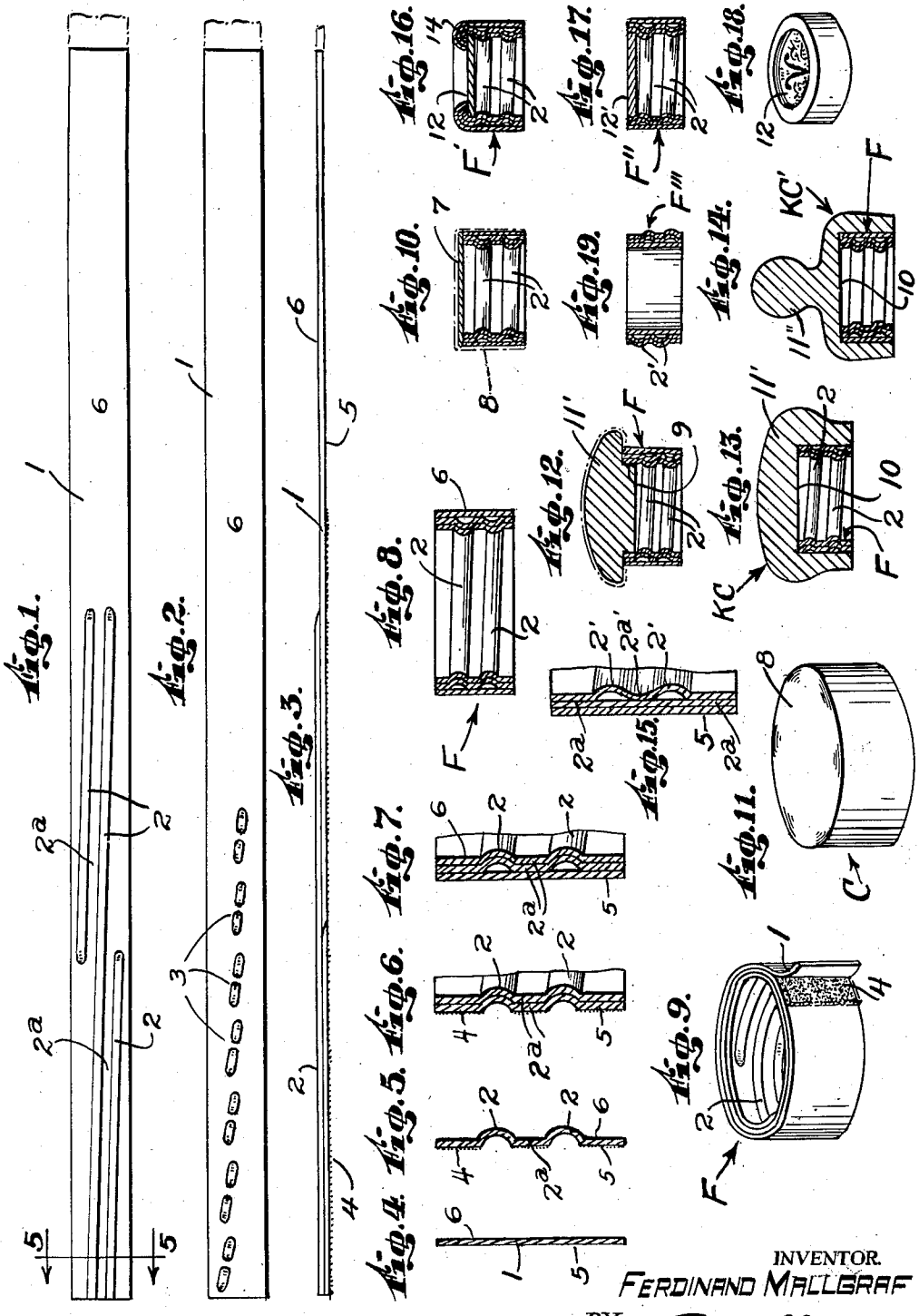
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NONMETALLIC FERRULES FOR CAPS OF CONTAINERS

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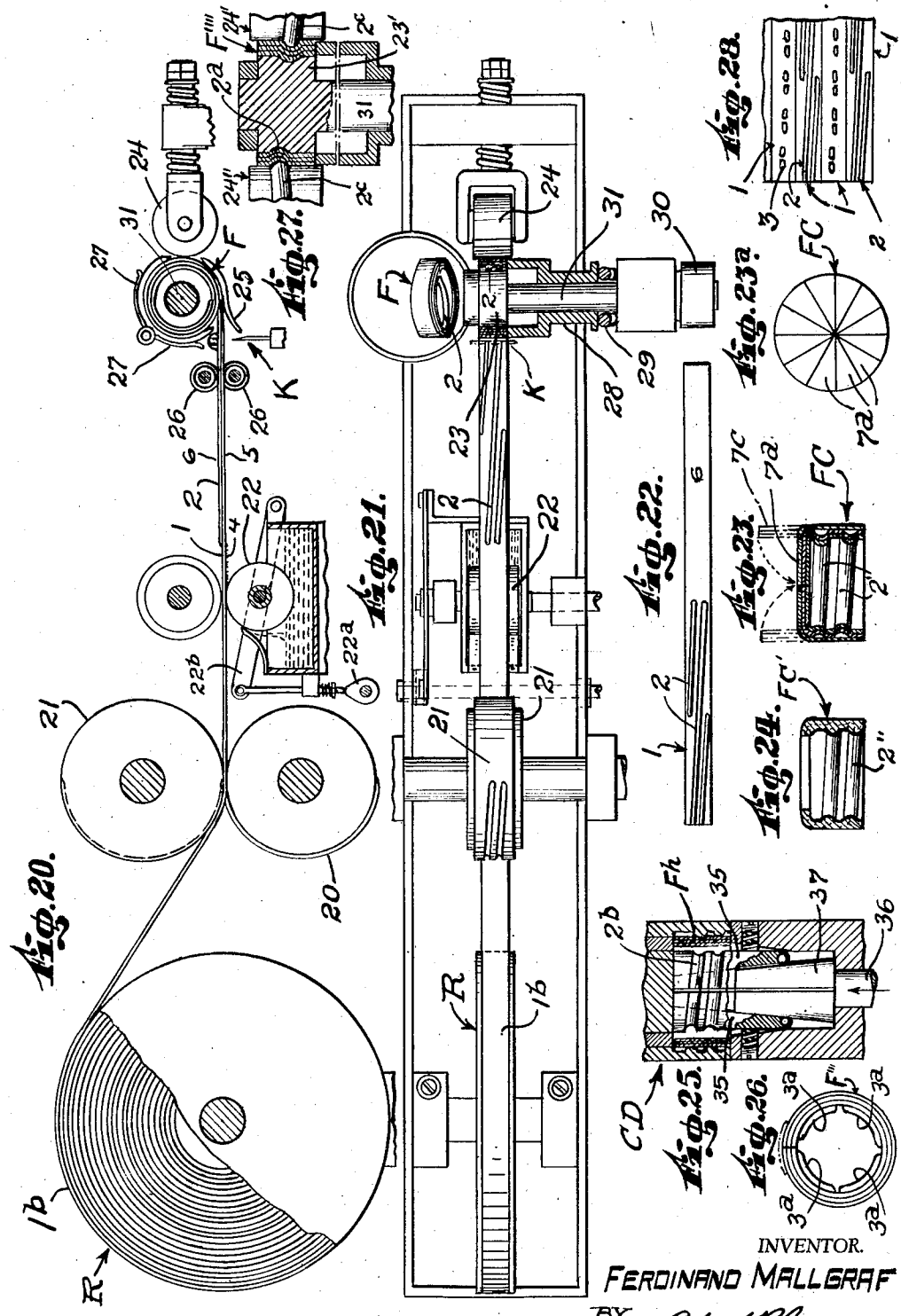


Fig. 20.

Fig. 21.

Fig. 22.

Fig. 23.

Fig. 23a.

Fig. 24.

Fig. 25.

Fig. 26.

Fig. 27.

Fig. 28.

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NONMETALLIC FERRULE FOR CAPS OF CONTAINERS

Ferdinand Mallgraf, Little Neck, N. Y.

Application May 25, 1942, Serial No. 444,482

1 Claim. (Cl. 215—43)

This invention relates to non-metallic caps or closure means for containers, particularly to the forming of strips of paper or paper-board into laminated ferrules, in which the screw threads or embossings are formed therewith.

The important feature of this invention, is the adaptability for making the non-metallic flange of the cap member from heavy paper, paper-board or any other suitable thin flexible material, with the necessary width similar to a tape or strip, which may be fed from a roll or in cut lengths in between the forming male and female rolls that form the necessary threads on a portion of the strip, which is thence wound or rolled into a ferrule by ring forming rollers, for example, into a three ply thickness, glue being applied on a portion of one side of the strip, so after the winding and rolling operation, the formed non-metallic ferrule or ring with its threaded portion is dislodged from the ferrule forming roll, after which it drys and becomes hardened, making it firm and strong, due to the laminated spiral or wound portions, glued or secured otherwise together, as may be desired.

Another important feature of this invention is that the unglued portion of the strip forms the outer surface of the screw ferrule or ring member, in which this exposed outer surface may be finished in any desired color or decorative design, which may or may not correspond with the top cover member secured onto the ferrule that forms the cap member.

Another important feature of this invention, is the variable means of applying and securing the top cover member, either separately or forming it from the paper-board strip itself, in the latter integral form the strip is increased in width so the added portion may be suitably cut after the forming operation of the ferrule, to form the top cover portion of the cap.

Another feature of this invention, is the adaptability of applying a knob head member of any suitable material, for example, of wood, as a part of the finished cap, in which the screw ferrule is inserted securely into a counterbore or recessed portion of the knob head member.

Other features of this invention will appear as the description proceeds in the following specification, accompanied by the annexed drawings, in which

Figure 1 is a plan view of the threaded side of the paper-board strip of this invention.

Figure 2 is a similar view showing the threads broken in staggered-like formation.

Figure 3 is a side elevational view of Figure 1, showing the raised threaded portion on one end of the strip.

Figure 4 is an enlarged cross sectional view of the strip before forming the thread portions therein.

Figure 5 is a similar view of the same paper-board strip shown in Figure 4 formed with the threaded portions.

Figure 6 is a similar view of the same strip after the threaded forming operation has been formed into a ferrule, and shows a fragmentary portion thereof laminated, the threads synchronizing into each other.

Figure 7 is a similar view showing the strip now wound into a 3-ply laminated ferrule with unthreaded portion on the outside thereof.

Figure 8 is a sectional view of the finished ferrule member made up from the paper-board strip just described.

Figure 9 is a perspective view of the threaded paper-board ferrule, with the end of the wound strip turned out showing the termination of the glued side of the strip.

Figure 10 is a reduced sectional view showing the cover member secured to the top of the ferrule by a gummed paper shown in dot-dash lines, which completes the cap element.

Figure 11 is a perspective view of the cap element in Figure 10.

Figures 12, 13 and 14 show in sectional views different knob head caps provided with the threaded ferrule of this invention.

Figure 15 shows one laminated portion threaded with the two outer laminated portions without any threaded portion.

Figure 16 is a sectional view of the threaded paper-board ferrule turned or beaded over to secure the sunk-in cover member.

Figure 17 is a similar view with the cover member formed flush with top of the ferrule.

Figure 18 is a perspective view of cap member shown in Figure 16.

Figure 19 is a sectional view of an alternative ferrule form showing the threaded portion wound on the outside thereof.

Figure 20 shows diagrammatically one method of making and forming the threaded paper-board ferrule from a roll, in which cutting means is embodied at the ferrule forming rollers.

Figure 21 is a plan view of Figure 20.

Figure 22 is a plan view of a cut strip that may be fed in between the thread forming rollers, that eliminates any cutting operation as shown in Figure 20.

Figure 23 is an integral formed ferrule and top cover portion.

Figure 23*a* is a top plan view of the cap which is shown in Figure 23.

Figure 24 shows a one ply threaded non-metallic threaded cap member.

Figure 25 is a chuck and die thread forming device that may form the threaded portions in the ferrules.

Figure 26 is a plan view of the ferrule member shown in Figure 25, after the inner threads or embossing has been formed in the chuck-die device.

Figure 27 is a similar fragmentary view that is shown in Figure 21, of the ferrule forming rollers, whereat, threaded or embossed portions may be formed with means provided therewith.

Figure 28 is a fragmentary view of a blank or sheet of paper-board in which the threaded portions, embossing or indentations are formed therewith, after which the strips are cut.

Referring to the drawings, the numeral 1 designates a strip of paper, paper-board, or any other similar non-metallic flexible material, having threaded portions 2 formed on a portion thereof, as shown in Figure 1, with flat portion 2*a* between the threads to provide means for glueing or cementing the laminated portions, which may be 2 ply or more, preferably 3 ply thickness, or may be provided with broken threaded portions or depressions 3, as shown in Figure 2. A glue, gum or cement surface 4 is provided to the flat surface 2*a* of the underside 5, the threaded portions 2 being raised on the surface or side 6 of the strip.

The above strips of tape-like paper or paper-board 1, are productively formed into threaded laminated ferrules or rings F as shown clearly in Figures 4 to 11, inclusive, after which they may be formed into cap members C, by means of a cover member 7 and gum paper 8, as shown in Figures 10 and 11. The threaded ferrules or rings F may be secured onto a shoulder extended portion 9 as shown in Figure 12, or may be secured into a counter-bored or recessed portion 10 of a non-metallic knob head member 11, thereby providing a strong and novel cap member KC.

In Figure 15, the threaded portion 2' may be universal, that may screw onto any threaded portion of a container. In the original threaded portion 2 a flat surface 2*a* between the threads provides gluing and securing means to the laminated portions.

In Figures 16 and 18, a cover member 12 may be inserted and secured in a sunk-in manner, by beading or rolling over the upper edge 14 of the ferrule F' as shown.

In Figure 17 the cover member 12' may be made flush in which a recessed portion 15 of the ferrule F'', allows the member 12' to be snapped therein and when covered by the finish paper 8, as shown in Figure 11, provides a durable strong cap structure, as the cover member 7 may be twisted off if the turning of the screw cap member C if forced too strongly.

In Figure 19 the ferrule F''' shows the threaded portion 2' on the outside thereof, which may be adopted in some cap features for a cork or stopper member.

In Figures 20 and 21, a diagrammatic layout shows the means of feeding a tape-like strip of paper or paper-board 1*b* from a roll R in between a male roller 20 and a female roller 21 that forms the partial threaded portion 2 of the strip over the gluing roller 22 towards the ferrule or ring forming rollers 23 and pressure roller 24 where subsequently a knife K cuts the required length desired, in which a feed chute 25 forms guiding means for the cut free end beyond the idle rollers 26 which leads the subsequent strip into the next ferrule operation between the rollers 23 and 24 and yielding guide plates 27. The laminated ferrule member F is pushed off its forming roller 23 by means of a plunger 28 actuated by a suitable means, as for example by a forked lever 29 operated by any suitable power means. A pulley 30 on the shaft 31 may be driven by a belt not shown, for rotating the roller 23 to form the desired spiral layers of laminations forming the ferrule or ring member F.

In Figure 20, the gluing roller 22 is provided with a cam control 22*a* that lowers and raises the lever 22*b* and roller 22 from strip or tape 1, thereby omitting gluing for any desired portion of the strips 1, or for gluing the surface 5, or any portion of the surface 6, if so desired. Glue is not applied to the threaded portions 2, 2', 2'' and 2''', but only onto the flat surface 2*a* adjacent thereto. However, the securing together of the ferrule is optional, as wherein the threaded portion is made universal, as shown in Figure 15, whereat the glue may be applied to the threaded portion 2*a*''.

In Figure 23 an integral form of a threaded ferrule FC and top cover portion 7*a*, formed from the added extended width 7C as indicated in dot-dash lines, into a sector-like formation as shown in Figure 23*a*, folded over portion may or may not be scored, all of which is optional.

In Figure 25 is a chuck-die device CD for alternatively forming threads into the ferrule F*h*, after the strips 1 have been formed into a laminated formation, as shown in Figure 19, without the threads 2 as hereinbefore described and shown in the drawings. The tapered dies 35 being forced out and in by the plunger 36 and its wedging ends 37, springs controlling said operation of the grooves 2*b* that form the threads 2 or embossing 2, these dies may rotate slightly, about 30°, to make the full continuous thread portion, and the embossings 3 are so that they form the threaded or embossed portion 3*a*, as shown in Figure 26. These continuous threaded portions 2 are for small size threads so the rolling may be more convenient, and if not then these continuous threads are to be formed after the ferrule has been formed, as hereinbefore described.

In Figure 27 is shown another method of forming the threads 2 or embossings 3, whereby the ferrule forming rollers 23', 24' and 24'' may be provided with female and male portions, 2*a* and 2*c*, which may form a large size single thread 2 or embossings 3 in the ferrule F''''. The rollers 24' and 24'' must be moved away from the formed ferrule when the plunger 31 forces finished ferrules off the split or chuck-roller 23'.

If so desired, the ends of the laminated strips may meet in a flush-like manner to form the ferrule as shown in Figure 26, and gummed label or paper band may be secured thereat, all of which is according to the outer finish desired for the cap member shown in Figure 16, wherewith the ferrule member becomes the integral flange portion of the cap member F'''. Embossed portions may be construed as portions raised, or indentations such as crimping.

It is to be understood that the gluing or securing together of the laminated portion may be accomplished by any other suitable means than

shown in the drawings and described hereinbefore, such as by stapling, or interlocking the ends of the strips thereof, just so the ferrule is formed solidly in a durable and firm manner.

I do not confine myself to the drawings, which are not exactly true, possibly exaggerated in some parts, as they merely disclose the principle of the non-metallic ferrules that finally becomes the securing flange of any cap or stopper, which in time of war, the production of metallic caps being prohibited, paper-board caps are a necessity.

It is to be understood I may alter any part of my invention, providing same comes within the scope of the appended claim.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States of America, is as follows:

A non-metallic cap for containers of the character described, comprising a three layer ferrule member having two inner layers and an outer layer and being formed from a tape-like strip of paper-board having laterally spaced thread portions pressed in one end of said strip with flat surfaces between said thread portions, the other end of said strip being without any thread, said flat surfaces between said thread portions having glue applied thereto, said strip being wound to form said three layer ferrule member, said thread portions being in said two inner layers with the thread portions of each of said two inner layers being in registration with each other, and said outer layer having no thread and providing means for any suitable covering for the complete cap, said glue securing said two inner layers and said outer layer together.

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