May 29, 1956 W. L. CANNING ET AL 2,747,210

COATING APPLICATOR

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FIG. 1

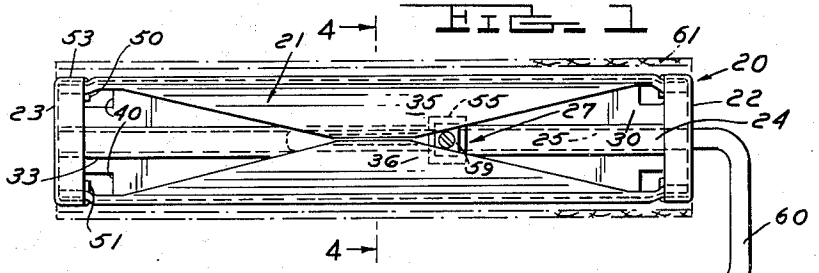


FIG. 3

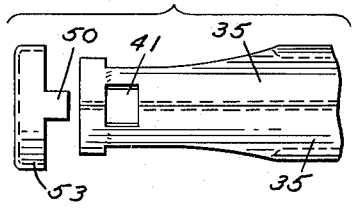


FIG. 2

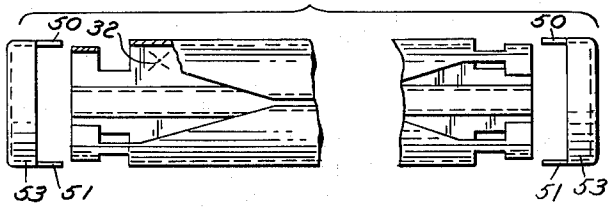


FIG. 6

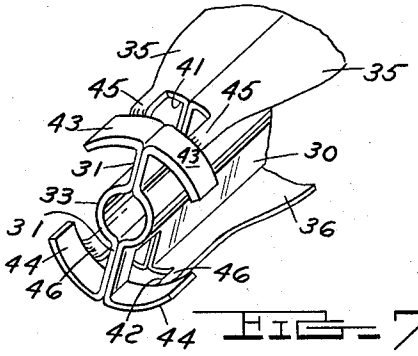


FIG. 5

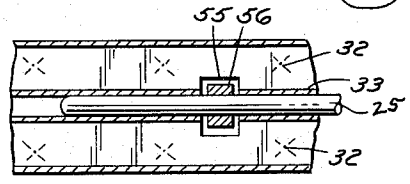


FIG. 4

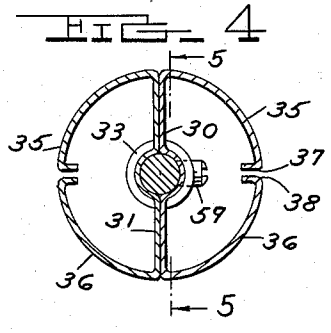
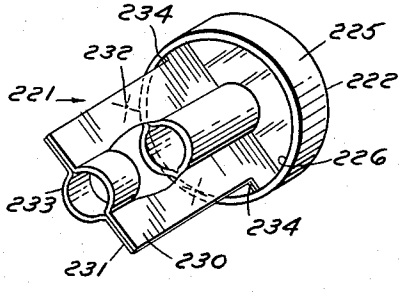


FIG. 7



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FIG. 8

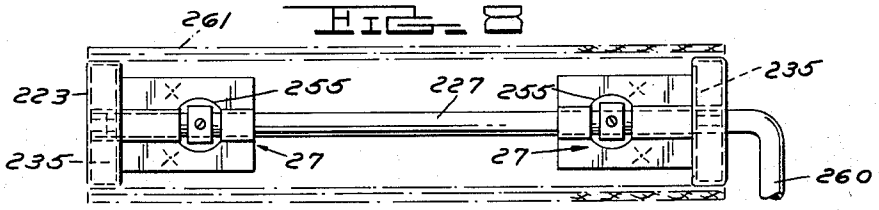


FIG. 9

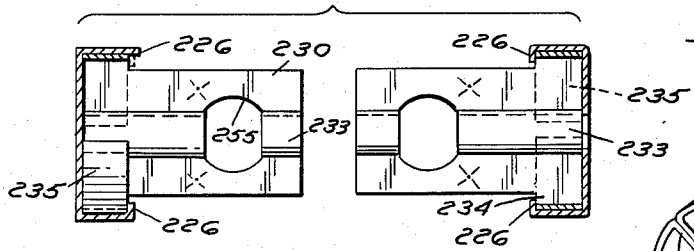


FIG. 10

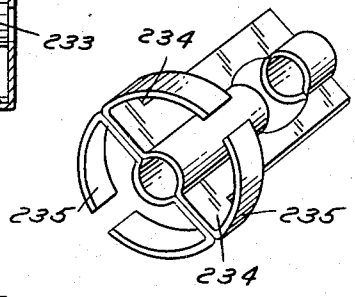


FIG. 11

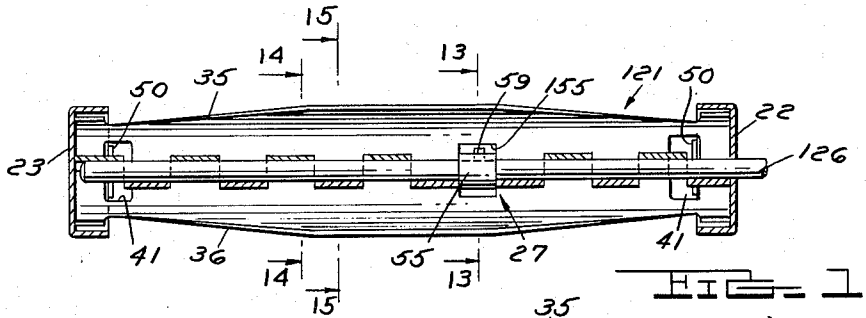


FIG. 12

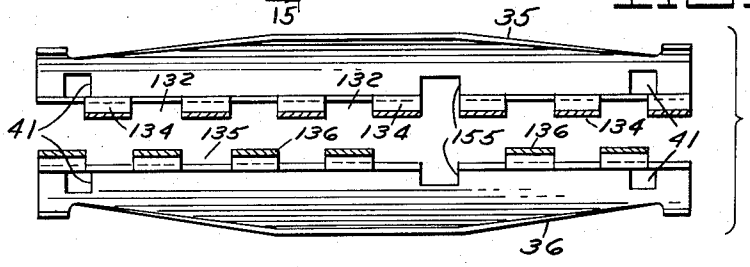


FIG. 13

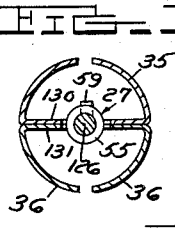


FIG. 15

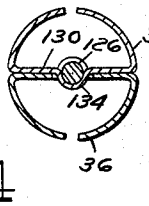
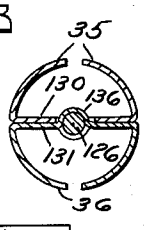


FIG. 14



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2,747,210

COATING APPLICATOR

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Application September 8, 1953, Serial No. 378,838

6 Claims. (Cl. 15—230)

This invention relates to coating applicators and more particularly to a rolling paint or other coating applicator having relatively few parts which are so integrated that the handle shaft may be journalled a considerable portion of its length and completely internally contained, thereby eliminating any possibility of a projecting shaft end marring a portion of a structure being coated and enabling one end of the applicator to have a completely smooth face which dispenses with any possibility of paint or other coating dripping off the end of the roller.

Many forms of coating rollers exist in the prior art but each of these appears to embody one or both of two major disadvantages. The first of these disadvantages is the matter of providing bearings for the shaft of the applicator handle. The conventional manner of rotatably journalling the shaft in the roller shell is to pierce the end caps and project the shaft axially through the shell with the caps themselves serving as bearings. The caps are usually made of light gauge metal with the result that the bearing supports for the roller shell are little more than point contacts with the result that either the bearing surfaces of the end caps or that part of the shaft in contact with the bearing surfaces soon becomes worn preventing smooth rolling of the applicator shell about the handle shaft whereupon the applicator must be discarded.

Certain types of prior art devices have overcome the above disadvantage by providing the end caps with elongated bronze or the like bushings or by making the roller shell of a cored cylinder and lining the bore with a suitable bearing material. These forms of construction are objectionable from the point of expensiveness and even where these constructions are used, the second disadvantage is not overcome. This disadvantage lies in the fact that the free end of the handle shaft of all known prior art applications have had to be secured. One means of securing the free end of the shaft is to project that end through an aperture in the applicator end cap and through the use of a washer and cotter pin or screw, secure the shaft against removal from the applicator shell. The objection to this type of construction is that the shaft end projects beyond the end of the applicator and prevents the user from coating a surface such as a vertical wall as close to the corner as desired without marring the surface of the adjoining wall by the projecting shaft end. To overcome this objectionable feature, it has been proposed to inwardly offset the end cap of the applicator so that the shaft end may be secured and still not project beyond the end of the applicator body. This construction, however, forms a well in the end cap in which paint or the like may collect when the roller is immersed. When the applicator is rolled over the surface to be coated the coating in the well leaks or drips out onto either the surface being coated or onto some other surface where no coating is desired.

With the foregoing in view, it is a primary object of this invention to provide a coating applicator wherein the body thereof forms substantially continuous bearing means for a shaft.

Another main object of the invention is to provide a coating applicator having no projections extending beyond one end of the applicator body.

Another object of the invention is to provide means for securing a handle to the applicator internally thereof.

Another object of the invention is to provide a coating applicator shell which is expandible and contractible so as to releasably retain a coating tube or jacket thereon.

Another object of the invention is to provide a coating applicator which may be easily and quickly disassembled for cleaning.

Another object of the invention is to provide a coating applicator which is inexpensive to manufacture, simple and easy to use, and rugged and durable in construction.

These and other objects of the invention will be specifically pointed out or will become apparent from the following specification when considered in conjunction with the accompanying drawings wherein:

Fig. 1 is an elevational view of one form of coating applicator having a handle secured thereto;

Fig. 2 is an exploded view, partly in cross-section, illustrating the various parts of the applicator body disclosed in Fig. 1;

Fig. 3 is an exploded fragmentary view of the body shell and one end cap illustrating the manner in which the cap is secured to the body;

Fig. 4 is a cross-sectional view of the applicator body taken on the line 4—4 of Fig. 1;

Fig. 5 is a partially cross-sectional view of a portion of the roller body taken on the line 5—5 of Fig. 4;

Fig. 6 is a fragmentary perspective view of the shell of the applicator body with its end cap removed;

Fig. 7 is a perspective view of another form of applicator body;

Fig. 8 is a view similar to Fig. 1 but showing a coating applicator composed of a pair of body members of the type illustrated in Fig. 7;

Fig. 9 is a view partly in cross-section of the pair of body members of Fig. 8 more clearly illustrating the structural form thereof and showing how the end caps are secured to the shell;

Fig. 10 is a perspective view of the shell disclosed in Figs. 7–9 with its end cap removed;

Fig. 11 is a cross-sectional view of an alternative construction of the applicator body disclosed in Figs. 1–6;

Fig. 12 is an exploded, cross-sectional view of the shell disclosed in Fig. 11 with the end caps removed; and Figs. 13, 14, and 15 are cross-sectional views taken on correspondingly numbered lines of Fig. 11.

Referring now to the drawings wherein like numerals refer to like and corresponding parts throughout the several views, the embodiment shown in Figs. 1–6 to illustrate one form of the invention comprises generally an applicator **20** composed of a shell **21**, end caps **22** and **23**, journalling means **24** for reception of the shaft **25** of a handle **26**, and securing means **27** for releasably retaining the shaft within the body of the applicator.

More particularly, the applicator **20** comprises a body shell **21** composed of a pair of mating plates **30** and **31** placed in back-to-back relation and suitably secured to each other as at **32** by spot welding or the like. The midportion of each plate **30** and **31** is bowed outwardly in semi-circular form so as to provide an axially extending, circular housing **33** adapted to receive and journal the shaft **25** of handle **26**.

From the edges of the plates **30** and **31** extend top and bottom tapering flanges **35** and **36** which are curved outwardly so as to extend outwardly from the plates **30** and **31** and form an enclosing shell **21**. The curvature of the flanges **35** and **36** is elliptical rather than cylindrical for a purpose to be poined out subsequently and the edges **37** and **38** of the flanges **35** and **36**, respectively, do

not meet, but terminate short of each other as is best illustrated in Figs. 1, 2, and 4.

Adjacent each end of the plates 30 and 31 is a rectangular slot 40 which extends into flanges 35 and 36 so that at their juncture with the plates 30 and 31 there is an opening 41 and 42. At the end of each plate 30 and 31 is a tab 43 and 44 curved outwardly on a circular radius from its plate and being joined to flange 35 or 26 by a narrow connecting strip 45 or 46, which connecting strip, obviously, defines a portion of the opening 41 or 42. Each of the connecting strips 45, 46 is bent slightly toward the axis of the shell 21 and the juncture of the tabs 43 and 44 with the plates 30 and 31 is slightly radially inwardly of the juncture of the flanges 35 and 36 with the plates 30 and 31. The purpose of this radially inwardly offset at the ends of the shell is to permit end caps 22 and 23 to enclose the ends of the shell and have the outer circumference of the caps at the same level as the outer surfaces of the flanges 35 and 36.

Caps 22 and 23 are both structurally identical with the exception that cap 22 is provided with an axial aperture for reception of shaft 24. With this exception in mind, the description of one cap and its manner of attachment will illustrate the other cap also.

With particular reference to Figs. 1, 2, and 3, cap 23 comprises a cup shaped cylinder having a closed end being provided with a pair of oppositely disposed projecting fingers 50 and 51. The length of cylindrical walls 53 of the cap corresponds to the axial width of the tabs 43 and 44 of the shell 21 so that when the tabs are placed within the cap, the edge of the cylindrical wall 53 lies flush with the inner edges of the tabs. With the tabs 43 and 44 positioned within the end cap, the fingers 50 and 51 are bent over so as to project into the openings 41 and 42 and securely retain cap 23 in fixed position on the shell.

Referring now to Figs. 1 and 5, the plates 30 and 31 are apertured as at 55 adjacent their axis of rotation for reception of shaft securing means 27. Securing means 27 comprises a short collar 56 having a bore slightly greater than the diameter of shaft 26 and the wall of collar 56 is provided with a threaded screw hole into which is threaded a set screw 57 adapted to abut shaft 26.

To assemble the coating applicator 20 the end caps 22 and 23 are secured to the shell 21 in the manner described and through the axially apertured cap 22, the free end of handle shaft 26 is inserted. The user holds the collar 56 in its aperture 55 with his fingers and projects the shaft end therethrough until the reversely bent portion 60 of the handle is brought adjacent cap 22. At this time the user turns set screw 59 into abutting relation with shaft 26 so that collar 56 becomes fixed relatively to shaft 26 which prevents the shaft being withdrawn from the shell 21.

With the applicator body fixed to the shaft 26, tubular jacket 61 having a suitable fabric or other surface may be slipped over the shell 21. As was pointed out earlier in this specification, the flanges 35 and 36 are curved elliptically rather than radially. The purpose of this construction is to provide a means of retaining the tubular jacket 61 in non-rotatable relation with shell 21. Flanges 35 and 36 preferably are made of light gauge metal which is resilient in nature so that they are contracted in circumference when the tubular jacket is slipped thereover. Because of their resilient nature, however, the flanges tend to assume their unstressed position and consequently exert an outward or expanding force against the inside of the tubular jacket so as to frictionally prevent relative rotation of the shell and the jacket.

In the embodiment of the invention disclosed in Figs. 1–6, substantially the full length of the handle shaft 26 is provided with a bearing surface in that the tubular housing 33 fits snugly around the shaft and yet permits free rotation of the shell about the shaft. Due to the improved bearing structure of this applicator, the tendency of the shell to wear even after a long period of time is greatly reduced.

As has been pointed out, the shaft 26 is secured to the shell internally thereof by the securing means 27 which eliminates the necessity of piercing the end cap 23. Thus there is no projecting end of shaft 26 extending beyond the end of the shell to scrape or scratch objects during coating operations and, further, there is no recess in the end cap 23 in which coating material can collect and subsequently drip. An additional feature of the construction lies in the fact that the shaft 26 need not extend the full length of the shell, but may be terminated at any point beyond the securing means 27. This feature enables the expense of the applicator to be reduced from both a manufacturing and sales point of view.

That form of the invention disclosed in Figs. 11–15 is substantially identical to the form just described except for the manner in which the two shell plates are secured together. In Figs. 11–15 is illustrated a pair of plates 130 and 131 whose midportions are bowed outwardly so that plate 130 is provided with outwardly disposed loops 134 separated by openings 132 and plate 131 is provided with outwardly disposed loops 136 also spaced by openings 135, loops 136 being adapted to lie in the openings 132 adjacent loops 134. The plates 130 and 131 are positioned in back-to-back relation with the outwardly projecting loops of one plate interlocking with the outwardly projecting loops of the other plate in the same manner as the loops on a pair of hinge plates, for example. Plates 130 and 131 are provided with an aperture 155 for reception of locking means 27 and when shaft 126 is run through each of the pairs of locking loops, the two plates are held together just as a hinge pin secures hinge plates together.

In this form of the invention the handle shaft 127 preferably extends to a point just short of end cap 23 and it will be clear that the alternating loops of the two plates provide a substantially continuous bearing for the entire length of the shaft.

Except for the differences pointed out with respect to the plates 130 and 131, the applicator shell 121 of Figs. 11–15 is the same as that shown in Figs. 1–6 and for that reason no additional description of shell 121 is deemed necessary. It is important to note, however, that in the form of the invention disclosed in Figs. 11–15 the alternating loops which form the housing for the shaft also provide the means for securing the plates in back-to-back relation.

Referring now to Figs. 7–10, disclosed therein is another form of the invention which comprises a shell 221 composed of a pair of short plates 230 and 231 secured together in back-to-back relation by suitable means such as spot welding as indicated at 232. The midportion of each plate is pressed outwardly so that when the two plates are positioned back-to-back there is an axially extending tubular housing 233 which forms the journal for the handle shaft 226.

Adjacent one end of the plates 230 and 231, there is a pair of shoulders 234 from which extend circumferential tabs 235. A cup-shaped, cylindrical cap 222 is adapted to be slipped over tabs 235 and in this cap 222 the walls 225 are slightly longer than the width of the tabs 235 so that the extreme edge or flange 226 of the wall 225 may be rolled inwardly and engage the shoulder side of the tabs to retain the cap on the plates.

The shells 221 are to be used in pairs, one of which is to be affixed to the end of handle shaft 227 and the other of which is to be secured at a suitable place on handle shaft 227 in a direction toward the reversely bent portion 260 of the handle. In this type of roller shell only one of shells 221 will need have its end cap 22 pierced for reception of the shaft 226, permitting that shell at the end of the shaft to be equipped with a smooth faced cap 223 as in the embodiments hereinbefore described.

The manner of securing shells **221** to the handle shaft **227** is the same as that disclosed in connection with the other embodiments except that each shell **221** is centrally apertured as at **255** for reception of the usual locking means **27**.

The main advantage of the embodiment shown in Figs. 7–10 is that this form of coating applicator is adjustable in overall length to meet the requirements of any particular coating application. For example, if the surface to be coated is wide, the shells **221** may be moved apart the full length of the handle shaft **227** and a suitably firm tubular jacket **261** of proper length slipped over end caps **222** and **223** so as to span the distance therebetween. On the other hand, if the surface to be coated is narrow, right hand shell **221** (as viewed in the drawings) may be moved along shaft **227** toward the other shell **221** and a shorter tubular jacket may be installed thereon. By reason of the adjustable length characteristic of shell **221**, one need not purchase a plurality of applicators but need purchase only a single applicator and the desired number of different length jackets.

In each of the three embodiments of the invention shown and described, it will be clear that the applicator shell is provided with a substantially continuous bearing surface throughout its length. It will be clear also that there are no projections extending beyond the one end of the applicators, thereby completely eliminating the possibility of marring surfaces adjacent that being coated and, furthermore, that end of the applicator presents a smooth face incapable of collecting coating material thereon in such quantity that objectionable dripping or leaking will occur.

While the various forms of the invention have been shown and described in detail, this disclosure is intended as illustrative only, the invention itself being defined in the appended claims.

We claim:

1. A variable length coating applicator comprising a shaft, a pair of shells journalled on said shaft, each of said shells comprising a body having a pair of plates secured to each other in back-to-back relation, tubular shaft journalling means extending between said plates, a pair of end caps, one of which is secured to one end of one body, the other of which is secured to one end of the other body, one of said caps having a shaft receiving aperture therein, said body having said apertured cap being slidable along said shaft to vary the distance between said bodies, and a tubular jacket spanning the distance between said end caps.

2. A coating applicator as set forth in claim 1 wherein each of said shells is provided with means for locking said shell against sliding movement relatively to said shaft.

3. A coating applicator including an axle shaft constituting the axis of the device, a cylindrical shell rotatably disposed on said axle shaft; said shell comprising paired plates paralleling said axle shaft disposed in back to back relationship having contiguous surfaces secured together lying on radii of said axle shaft and having paired oppositely directed arcuate portions located midway between the radially outer edges of said plates together forming a tubular axle shaft receiving and housing portion outwardly concentric of said axle shaft constituting a journal surrounding said axle shaft, arcuate flanges leading in opposite directions from the radially outer edges of said plates adapted to terminate short of contact with each other forming an interrupted cylindrical shell; said arcuate flanges being spring-like in character so as to be capable of exerting a spring pressure radially outwardly of said axis so as to constitute means for holding a paint roller sleeve thereon, means for securing said shell axially of said axle shaft, and a handle on said axle shaft.

4. In a device as set forth in claim 3, said arcuate flanges being backwardly tapered from a point adjacent the axial center of said shell, paired arcuate tabs on both ends of both said plates co-operating with each other to form an interrupted circular flange having spring finger characteristics, and caps fitting over said arcuate tabs at either end of said cylindrical shell.

5. In a device as set forth in claim 3, said paired plates being detachably secured together; said paired oppositely directed arcuate portions located midway between the radially outer edges of said plates being interrupted and staggered and reversely formed so as to lie beyond the plane of the opposite plate and on the far side of said axle shaft relative to the plate from which each said arcuate portion emanates so that said portions form an interrupted laced tubular housing for said axle shaft with said axle shaft acting as a securing pin for said plates, and said plates' contiguous surfaces acting as stops for said arcuate portion.

6. A paint roller including an axle shaft and like oppositely disposed paint roller supporting ends rotatably disposed on said axle shaft; each said end comprising plates disposed in back to back relationship having contiguous surfaces secured together lying on radii of and parallel to said axle shaft and having paired oppositely directed arcuate portions located midway between the radially outer edges of said plates together forming a tubular axle shaft receiving and housing portion outwardly concentric of said axle shaft constituting a journal surrounding said axle shaft, paired arcuate tabs on the outer ends of said plates co-operating with each other to form an interrupted circular flange having spring finger characteristics, and a cap fitting over said arcuate tabs; said caps on said ends being adapted to support opposite ends of a paint roller sleeve; means axially locating said ends on said axle shaft, and a handle on said axle shaft.

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