March 11, 1924. 1,486,641

C. H. DASHER

POUCH MAKING PROCESS

Filed Dec. 2, 1922

Fig. 1.

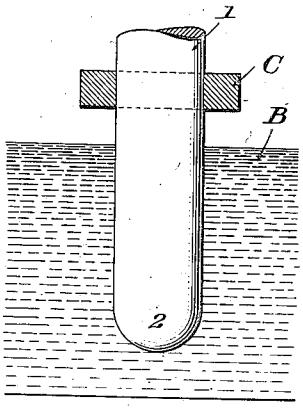


Fig. 2.

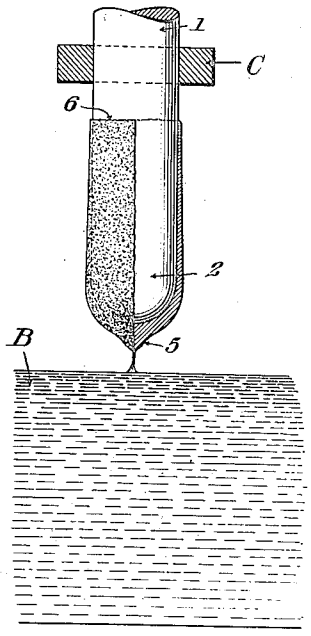


Fig. 3.

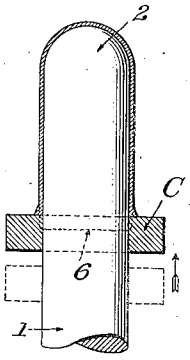


Fig. 4.

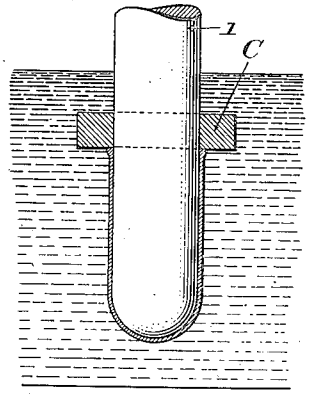
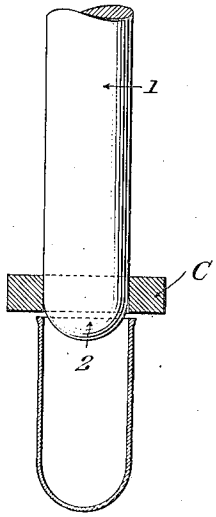


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES H. DASHER, OF EAST ORANGE, NEW JERSEY.

POUCH-MAKING PROCESS.

Application filed December 2, 1922. Serial No. 604,569.

To all whom it may concern:

Be it known that I, CHARLES H. DASHER, a citizen of the United States, and residing at East Orange, in the county of Essex and State of New Jersey, have invented a new and Improved Pouch-Making Process, of which the following specification is a full disclosure.

This invention relates to improvements in the method of making self-affixing caps, such as are employed for enveloping the corked end of bottles containing fluids susceptible to evaporation; such as perfumes, ether, and even ordinary liquids.

In the conventional method of making these caps, a mandrel of resistant material is dipped in a solution of cellulose xanthate (habitually known as so-called viscose) and, upon being withdrawn, it retains a film which is then "set" by a subsequent submersion in an appropriate coagulating solution, etc. In the course of the various subsequent steps, the coagulated film is manually manipulated to detach it from the mandrel. The film is still soft and rubber-like and has the shape of a pouch. The open end of this sac-like article is, however, surrounded by a more or less ragged edge; resulting from the fact that, when the mandrel is drawn from the bath of viscose, the solution (being decidedly tenacious) tends to leave only a feather-edge which gradually increases in thickness as it merges with the major portion of the pouch. These thin ragged edges are objectionable in the finished article and therefore it is necessary to cut off the extremity of the article before packing it for shipment. This entails loss of considerable material as scrap and it moreover consumes much time (which very materially increases the labor cost) and it likewise produces an edge which does not accurately coincide with a radial plane inasmuch as the article has to be collapsed when cut.

The present invention has for its object to produce a sac-like article, the rim of which will be truly circular in a flat plane and which will be at least as thick as the material constituting the body-portion of the pouch; even to the extent of exhibiting a slight bead, should that be desired. Another aim of the invention is very materially to reduce the manufacturing cost by accomplishing a complete elimination of the present necessity for manually trimming the detached pouches prior to shipment, and also to effect an elimination of much, if not all, of the manual manipulation heretofore required for the purpose of detaching the sac-like caps from the ends of the mandrels on which they are formed. This last-mentioned step has heretofore involved considerable time and trouble since it requires rather careful manipulation with the hands to roll back the feather-edge of the caps and thereby remove them, inside out, from the mandrel.

Other objects and advantages will be in part indicated in the following description and in part rendered apparent therefrom in connection with the annexed drawings.

To enable others skilled in the art so fully to apprehend the underlying features hereof that they may perform the same in the various ways contemplated by this invention, drawings depicting a preferred typical mode of operation have been annexed as a part of this disclosure and, in such drawings, like characters of reference denote corresponding parts throughout all the views, of which:—

Fig. 1 represents a mandrel thrust into a viscose bath to coat it initially. Fig. 2 represents the mandrel immediately upon being withdrawn from the bath. Fig. 3 represents the mandrel inverted to equalize the distribution of the coating with the follower slightly raised to initially shape the edge of the cap. Fig. 4 shows the mandrel and follower submerged to fix the film. Fig. 5 represents the follower in its advanced position after having stripped the finished pouch from the mandrel.

In carrying out this improved process, a highly polished mandrel A, having a truly cylindrical shank 1 terminate in an extremity 2 suitably contoured to give the finished article its desired shape and dimensions, is thrust vertically downwards into a sufficiently thick bath B of so-called viscose until the level of the liquid reaches a predetermined point on the shank of the mandrel. After allowing the mandrel to remain in place for a sufficient interval to permit the original level of the viscose to become restored, the mandrel is then withdrawn vertically upwards out of the bath. The fluid being thick and rather stringy tends to be stretched by the bath to accumulate by its cohesion in a large drop 5 at the lowermost

end of the mandrel and, to dissipate said drop-like accumulation, the mandrel is then quickly inverted into a vertical position to allow the excess material constituting the drop slowly to gravitate down and become uniformly distributed with the other portions of the thick liquid constituting the still-fluid film.

When the mandrel is withdrawn from the bath, the thick liquid adhering to it is comparatively thin at the point 6 where it terminates on the shank and, to avoid that objectionable formation from becoming a permanent charateristic of the film a so-called stripper C is so mounted on an extension of the shank as to be adapted, preferably by mechanical means, to be slipped along the shank toward its end. This stripper C has a snug-fitting relation with the shank of the mandrel and acts as a wiper therefor so that when the mandrel has been withdrawn and inverted, as previously described, this stripper is caused to slide upwardly on the then-inverted shank; the extent of its movement being such that it will slide slightly past the point defining the extent to which the mandrel has been submerged in the bath. The effect of this action is to cause the stripper to wipe the mandrel free of the deposited liquid viscose for a distance of about five millimeters or more, depending upon the extent to which it is desired to thicken the marginal edge of the finished article. This stripper pushes back the film of fluid viscose to the desired extent and consolidates it, in the form of a thickened annular ring, until it attains at least the thickness of the main body-portion of the sac-like article.

The embryonic article on the mandrel is thereby given approximately its ultimate shape and dimensions and it is now in a state suitable for being hardened or gelatinized. This is accomplished by again inverting the mandrel and promptly thrusting it downwardly into a suitable preliminary coagulating bath.

Coagulation of the viscose film can be brought about by solutions of neutral salts such as sodium chloride and the speed with which the coagulation occurs is dependent upon the concentration of the salt in the solution. In the practice of making these caps a salt of a di-basic acid as sulphuric acid is used and for this purpose ammonium sulphate is satisfactory. Also, in practice since the viscose is quite caustic, this salt is used in part in its acid form, viz, hydrogen ammonium sulphate and in part as neutral ammonium sulphate, and the required acid to keep this bath at proper strength is added as required. Further, it is the practice to maintain a flow of the coagulating bath counter-current to the movement of the viscose caps through the bath. Thus the caps in their progress through the bath keep meeting a higher acidity liquor and the acidity being depleted by contact with caustic caps. The coagulating viscose then becomes acid or almost so, at the time it leaves the bath. This coagulation is complete whenever the coagulated viscose becomes acid. It is then regenerated cellulose highly hydrated and filled with precipitated sulphur.

The above described coagulation steps result (in the absence of the stripper) in a shrinkage of the molded cap, generally in two dimensions, viz, length and thickness of film and always in one demension, viz, thickness of film. The mold restrains shrinkage in diamenter. With smooth molds such as are commercially used (and undoubtedly also dependent upon the coefficient of friction between the wet viscose film and the material of the mold) the shrinkage is invariably in the two dimensions specified above. Naturally the smoother the surface of the mold, the lower is the apparent friction effect of this surface. This shrinkage results in the cap adhering closely and tightly at this stage to the mold.

It has been further discovered, in devising the new process, that the cohesion between the stripper and the coagulating viscose is such (and by roughening the surface can be increased) that shrinkage in length is eliminated entirely and the shrinkage is restrained to the thickness. Consequently, by utilizing the new process, a commercial cap can be manufactured to a predetermined length and with a properly thickened edge.

It will be appreciated that the sac-like article, as it leaves the hardening bath, very completely envelops the end of the mandrel and is in close intimate contact therewith; so much so that it would be difficult, at that stage, to remove it without breaking the film on account of the closeness of its adherence and because of the formation of a vacuum at all internal points where the parts were somewhat separated. However, this removal is rendered possible by a peculiar action of the above-described acid bath.

That is to say, it has been further discovered that, when these caps on their molds are treated with coagulating baths of such final acidity that they are fully acid as they leave the bath, a gas generation occurs between the coagulated cap and its mold which is sufficient to break the contact between them. This gas is sufficient in volume and pressure to prepare the way for the next labor-saving step; which is that of mechanical stripping. By using the above mentioned wiper as a device to strip the cap from its mold, the cap may be detached without distorting it, since this gas breaks the vacuum that, otherwise,

would result in any attempt to remove a perfectly fitting elastic cap from its mold. Such a vacuum would necessarily collapse the elastic cap, during the withdrawal of the mold, and wrinkle it badly.

The stripping is now accomplished after removing the mandrel from the acid bath, by causing the follower or stripper C to advance along the shank 1 towards the head thereof. The follower, while snugly encircling the shank, slides smoothly along it and functions, without unduly wrinkling or in any manner injuring the sac-like film thereon, to push it off the end of the mandrel as shown by Fig. 5.

The detached caps, at this stage, represent a considerable saving; not only in labor but likewise in material. They have no excess imperfect length that has to be sheared off and regarded as scrap. In the old method, the longitudinal shrinkage alone (regardless of the undesirable feather edge) made it necessary to make initial submergence sufficiently deep to over-compensate for the longitudinal shrinkage; that being the only way of avoiding the production of a certain number of too-short caps. In other words, the ultimate shear-off step was depended upon to attain the length desired for the finished product. This loss is entirely avoided in the present process.

The detached and truly dimensioned cap is then submerged in a washing bath for a sufficient period and is thereupon placed in a de-sulphurizing bath consisting, for example, of sodium sulphite. It may be explained, that when the film was subjected to the action of sulphuric acid it was rendered quite opaque in appearance by reason of being impregnated with free sulphur produced by the action of the free acid. To restore the film to its original translucence, is the purpose of the de-sulphurizing bath; the free sulphur being simply dissolved by the sodium-sulphite or whatever other sulphur-dissolver may be resorted to.

The film is now washed again to free it from the sodium sulphite and is then ready for such further finishing operations as may be desired. For example, it may or may not be bleached and it may or may not be colored by the use of suitable dyes. After whatever finishing has been performed, the caps are packed, while still moist, with some suitable preserver, such as formaldehyde, in suitable containers which are sealed to prevent evaporation and hardening so that the films will reach the ultimate user in their elastic condition. They are then in condition for immediate use; which merely requires that they be slipped over the corked-end of a bottle and permitted to dry; whereupon they shrink into place and produce the parchment-like covering habitually seen on bottles of perfumery and the like.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can, by applying current knowledge, readily adapt it for various utilizations by retaining one or more of the essential characteristics of either the generic or specific aspects of this invention, and, therefore, such adaptations should be, and are intended to be, comprehended within the meaning and range of equivalency of the following claims.

Having thus revealed this invention, I claim as new and desire to secure the following combinations and elements, or equivalents thereof, by Letters Patent of the United States:

1. The art of making a viscose article which consists in first depositing on a mandrel a coating of fluid viscose; then predetermining the ultimate length of the finished product by pressing the edge of the fluid back somewhat with a follower; then producing a flexible tenacious film by effecting a coagulation of the coating while retaining the follower in said position; and subsequently detaching the flexible film from the mandrel.

2. The art of making a viscose article which consists in coating a mandrel with fluid viscose; then effecting a coagulation of said viscose under conditions to produce gas between the film and the mandrel to reduce the adhesion; and then causing a snug-fitting follower to slide along the mandrel and detach the coagulated article.

3. The art of making in a predetermined length a stocking-like article of viscose, which consists in coating the end of a shouldered mandrel with fluid viscose and establishing contact between said shoulder and said fluid; then coagulating the fluid coating while still in contact with said shoulder to enable said shoulder to restrict the longitudinal shrinkage of the film; then removing the coagulated film from the mandrel.

4. The art of producing viscose sac-like caps of predetermined length without wastage which consists in coating a mandrel having a slidable shoulder with fluid viscose and causing said material to adhere to said shoulder; effecting a coalescence of said coating by a chemical reaction producing sufficient free gas to loosen the cap on the mandrel; and then causing said shoulder to advance to detach the cap from the mandrel.

5. The art of making viscose pouches which consists in first depositing on a mandrel a coating of fluid viscose; then accurately determining the location and thickness of the extreme edge of the fluid by pressing the fluid edge back somewhat with a follower; then with the follower in said

position effecting a coagulation of the coating to produce a tenacious film; then detaching the film from the mandrel.

6. The art of making viscose caps which consists in coating the end of a mandrel with fluid viscose; then advancing a snug-fitting follower along the shank of said mandrel to determine the length of the cap; then effecting a coagulation of said viscose under conditions to produce gas between the film and the mandrel to reduce the adhesion; and then causing said follower to slide along the mandrel until the coagulated cap has been detached from the mandrel.

7. The art of making viscose caps in a predetermined length which consists in coating the end of a shouldered mandrel and the side-face of said shoulder with fluid viscose; then initiating the coagulation of the fluid coating while in contact with said shoulder to enable said shoulder to restrict the longitudinal shrinkage of the film; then completing the coagulation under gas-evolving conditions adapted to lessen the adhesion between the film and the mandrel and then removing the film from the mandrel.

8. The art of producing viscose caps of predetermined length without wastage which consists in dipping a mandrel having a slidable shoulder in a bath to coat it with fluid viscose; removing said mandrel from said bath and inverting it to cause said fluid material to adhere to said shoulder; effecting a coalescence of said coating under conditions producing sufficient free gas to loosen the cap on the mandrel; and then causing said shoulder to advance to detach the cap from the mandrel.

In witness whereof, I hereunto subscribe my name, as attested by the two subscribing witnesses.

CHARLES H. DASHER.

Witnesses:
MINNA STRAUCH,
DOLLY WEISHEIT.