July 1, 1958 J. DREEBEN 2,840,966

FORMING AND FILLING TUBES FOR PACKAGE MAKING APPARATUS

Filed Aug. 1, 1956

Fig. 1.

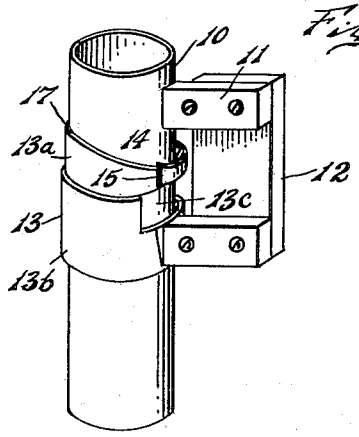


Fig. 2.

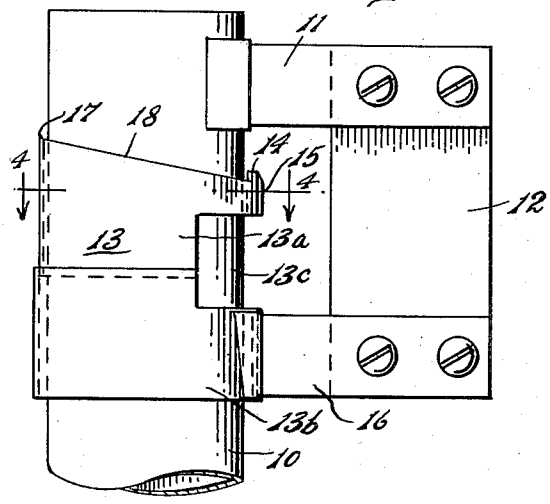


Fig. 3.

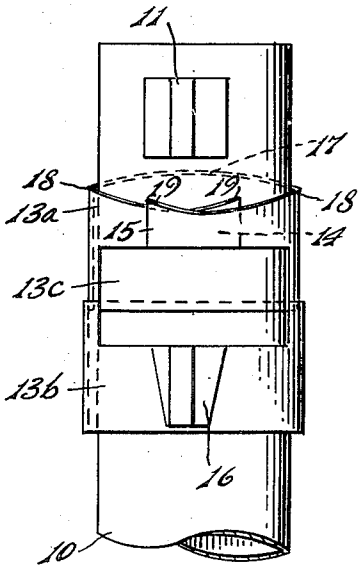
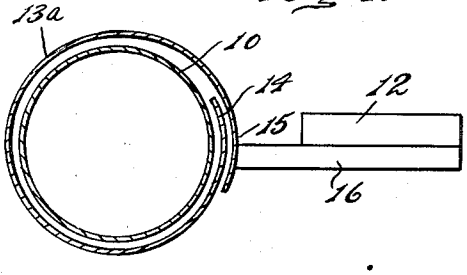


Fig. 4.



INVENTOR
Jack Dreeben
BY
B. T. Wolcottsmith
ATTORNEY

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FORMING AND FILLING TUBES FOR PACKAGE MAKING APPARATUS

Jack Dreeben, Philadelphia, Pa.

Application August 1, 1956, Serial No. 601,529

3 Claims. (Cl. 53—177)

This invention relates to forming and filling tubes for package making apparatus.

It has heretofore been proposed to draw transparent synthetic plastic sheet material from a web roll, form the web about a tube into a bag or envelope with a longitudinal seal along the web, fill the bag or envelope through the tube, seal the top of one package with simultaneous sealing of the bottom of the succeeding package, and sever the seal intermediate its top and bottom edges to separate the packages, this all being effected in a timed sequence.

One of the materials heretofore commonly employed has been regenerated cellulose in sheet form, available as cellophane, and this has a very low elongation rate.

The forming tubes heretofore available, and particularly the exterior forming shoes employed therewith, were suitable for sheet material of low elongation rate.

Upon attempting to form packages in a similar manner for polyethylene, with the forming tubes and shoes previously used, considerable difficulty has been encountered because of the high elongation rate which for polyethylene up to five mils (0.005 inch) in thickness is of the order of 300 to 800% with recoil approximately 65%.

Because of the elongation characteristics of the polyethylene the forming tubes, and particularly forming shoes heretofore available, have not functioned satisfactorily.

It is the principal object of the present invention, therefore, to provide an improved character of forming tube for use with sheet material of high elongation rate in a package forming machine.

It is a further object of the present invention to provide a simple but effective attachment for package forming machines by which high elongation rate sheet material from the web roll can be formed into a tube for longitudinal sealing and other operations.

It is a further object of the present invention to provide, for package forming and filling machines, a simple but effective forming and filling tube construction.

Other objects and advantageous features of the invention will be apparent from the description and claims.

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part thereof, in which:

Figure 1 is a view in perspective of a filling and forming tube in accordance with the present invention removed from the packaging machine;

Fig. 2 is a side elevational view of the filling and forming tube;

Fig. 3 is a rear elevational view of the filling and forming tube; and

Fig. 4 is a horizontal sectional view taken approximately on the line 4—4 of Fig. 2.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

Referring now more particularly to the drawings, the forming and filling tube in accordance with the invention includes a circular cylindrical tube **10** with a mounting bracket arm **11** secured thereto in any desired manner. The arm **11** is adapted to be suitable supported in the frame of the package making machine, being fastened to a mounting block **12**.

Spaced below the arm **11**, a split shoe **13** is provided having an upper section **13***a* and a lower section **13***b* with an open slot **13***c* therebetween. The upper section **13***a* is provided with overlapping end portions **14** and **15**. The shoe **13** is supported by a mounting bracket arm **16** which is preferably connected to the lower section **13***b* and also fastened to the mounting block **12** to hold the shoe **13** in predetermined relation to the tube **10**. The shoe **13** surrounds the tube **10** in spaced relation thereto (see Fig. 4) to provide clearance for the web and the end portions **14** and **15** are in spaced relation to the tube **10** and to each other to provide clearance for the web.

The top margin of the shoe **13** is of particular shape and relatively flat with respect to the horizontal, and includes an elevated part **17** with downwardly sloping parts **18** on each side, with upturned ends **19** extending slightly above the sloping part **18**.

It will be noted that the highest and lowest parts of the top margin of the shoe **13** are at diametrically opposed parts of the tube **10**. The difference in elevation between the highest and lowest parts of the top margin of the shoe **13** has been found to be of particular importance and is of the order of one fourth to one sixth of the diameter of the tube **10**. With differences in heights beyond this range excessive stretch of the elongatable web, or binding of the web, or both, occur and a smooth sliding action for forming the web into a tube is difficult to achieve.

It has also been found that the forming tube of the present invention works advantageously with feed mechanism as shown in my copending application filed July 20, 1956, Serial No. 599,204.

In use, a web of sheet material to be formed into a tube for package making is delivered in flat condition from a web roll and is delivered over the top marginal edge of the shoe and downwardly around the tube **10** for forming the web into cylindrical shape with the marginal edges overlapped. The web in passing over the top margin of the shoe **13** engages the elevated part **17**, the downwardly sloping parts **18** on each side with the margins guided by the upturned ends **19** and accommodated by the spaces between the end portions **14** and **15** and between the end portion **15** and the tube **10**. As the web moves downwardly its edges are maintained crossed and guided so as to be straight in their overlapped downward movement. The web edges thus maintain themselves in their proper position.

The hollow tubular web, as thus formed, is ready for longitudinal sealing in any desired manner, can have transverse seals applied thereto, the materials to be packaged being delivered in quantities measured as to weight, volume or number, as desired, through the interior of the tube **10** and above a transverse seal in a well known manner

I claim:

1. A web former for package making machines in which the longitudinal margins of an elongated strip of sheet material having a high elongation rate are brought together in overlapped relation for longitudinal sealing comprising a vertical abutment member for engagement by an inner of said margins, an upright shoe of round shape surrounding said abutment member and having inner and

outer end portions in overlapping and spaced relation and the inner end portion in spaced relation to said abutment, said shoe having a top marginal strip engaging and guiding edge, said edge having diametrically oppositely disposed uppermost and lowermost web guiding edge portions with the top marginal edge at said overlapped positions being upturned.

2. A web former for package making machines in which the longitudinal margins of an elongated strip of sheet material having a high elongation rate are brought together in overlapped relation for longitudinal sealing comprising a vertical abutment member for engagement by an inner of said margins, an upright shoe of round shape surrounding said abutment member and having inner and outer end portions in overlapping and spaced relation and the inner end portion in spaced relation to said abutment, said shoe having a predetermined interior transverse diameter through said overlapping end portions, said shoe having a top marginal strip engaging and guiding edge, said edge having diametrically oppositely disposed uppermost and lowermost web guiding edge portions, the vertical distance between said last mentioned web guiding edge portions being less than one fourth to one sixth of the said diameter.

3. A web former for package making machines in which the longitudinal margins of an elongated strip of sheet material having a high elongation rate are brought together in overlapped relation for longitudinal sealing comprising a vertical abutment member for engagement by an inner of said margins, an upright shoe of round shape surrounding said abutment member in spaced relation thereto and having inner and outer end portions in overlapping and spaced relation and the inner end portion in spaced relation to said abutment, said shoe having a predetermined interior transverse diameter through said overlapping end portions, said shoe having a top marginal strip engaging and guiding edge, said edge having diametrically oppositely disposed uppermost and lowermost web guiding edge portions with the top marginal edge at said overlapped portions being upturned, the vertical distance between said last mentioned web guiding edge portions being less than one fourth to one sixth of the said diameter.

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