Aug. 24, 1965 GEORG KOPP 3,201,913
ALSO KNOWN AS JÖRG KOPP
APPARATUS FOR FOLDING AND SEALING FILLED
PACKAGING HOSE OR THE LIKE
Filed Aug. 20, 1962 3 Sheets-Sheet 1

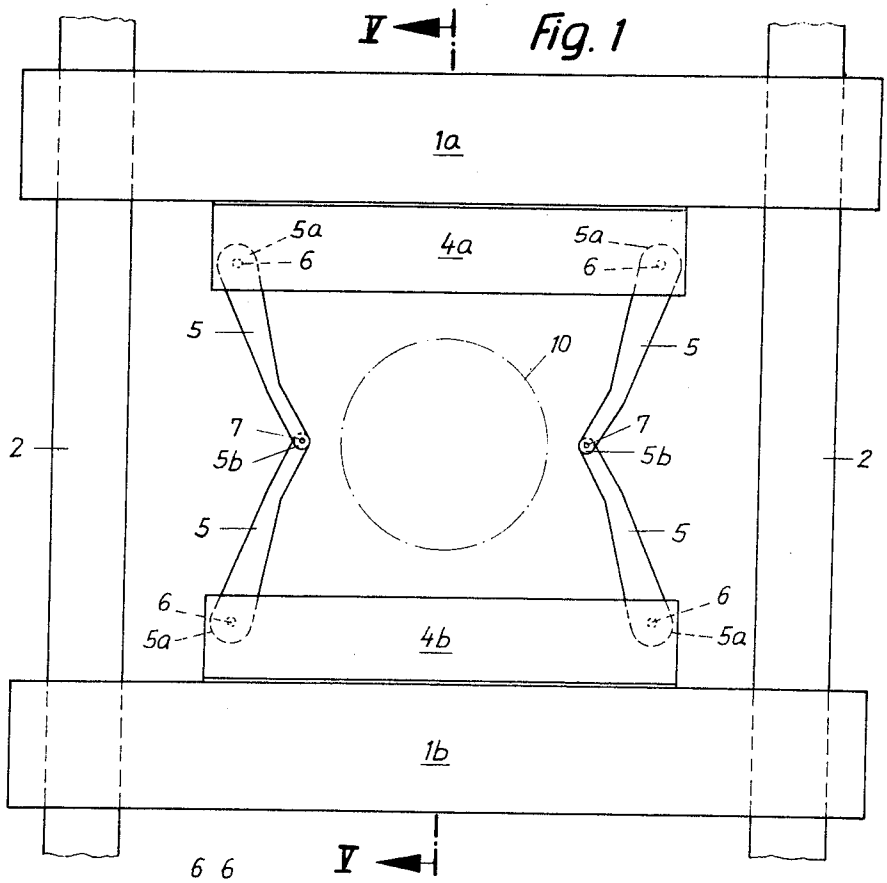


Fig. 1

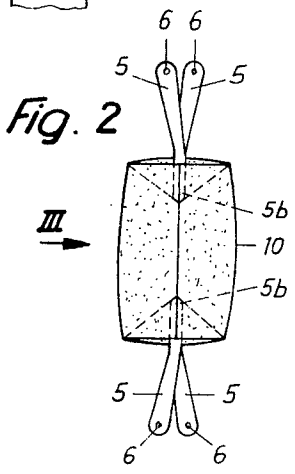


Fig. 2

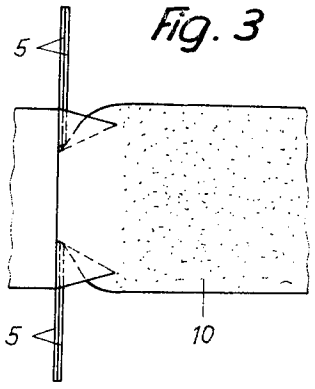


Fig. 3

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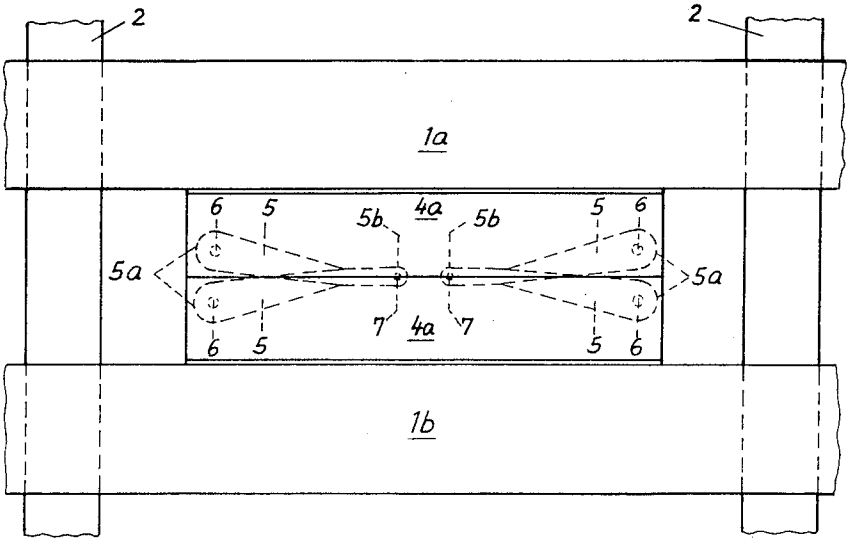


Fig. 4

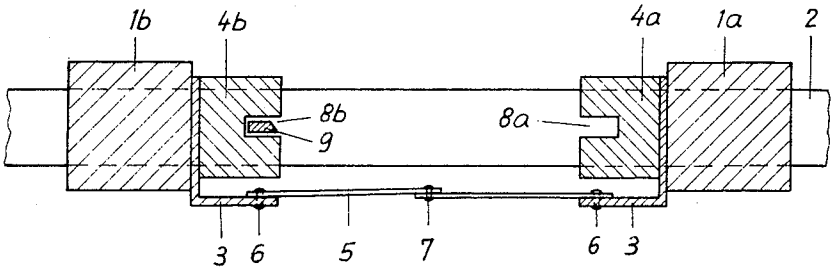
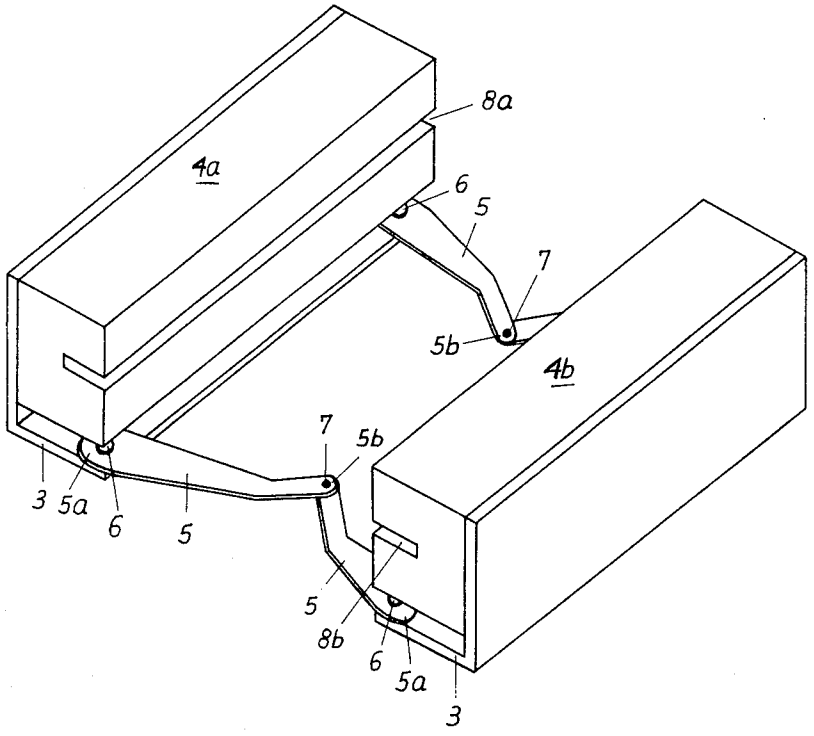


Fig. 5

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Fig. 6



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3,201,913

APPARATUS FOR FOLDING AND SEALING FILLED PACKAGING HOSE OR THE LIKE

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7 Claims. (Cl. 53—182)

The present invention relates to improved apparatus for folding and sealing filled packaging hose or tubing formed of sealable or weldable material by means of heated, parallel arranged and movable heating jaws.

Up to the present such packaging hose, after filling thereof, was pressed together by means of two heating jaws arranged transverse with respect to the axis of the hose, fused and then cut-through along the weld seam. In this manner there indeed resulted sealed packaging bags or containers which, however, did not exhibit a smooth front surface and, for this reason, were unable to stand in erect position. It has already been attempted to fold or bend the wall of the hose prior to pressing together the heating jaws by means of two oppositely arranged folding rods. Since these folding rods, however, had to be removed from contact with the hose prior to pressing together of the heating jaws, the folded hose portions upon pressing together of the heating jaws again returned into their original position, so that the desired result was either not obtained at all, or only to a limited extent.

Accordingly, it is a primary object of the present invention to provide an improved apparatus of the type described in which these disadvantages do not occur.

Another important object of the present invention is to provide improved means for folding a hose, tubing or the like prior to heat sealing thereof, whereby the folded hose portion remains in desired folded condition.

Still a further object of the present invention is to provide means for folding and fusing of packaging hose or the like in an efficient and reliable manner.

Still another important object of the present invention is to provide improved means for tucking in the ends of packing hose and maintaining such ends in desired folded condition until completion of a heat-sealing operation.

Another important object of the present invention is to provide an improved construction for folding and closing packaging hose, wherein means are provided for folding at least one end of the hose, and wherein these means are adapted to remain in contact with the hose throughout the welding or fusing operation, to thereby insure that such folded ends remain in the desired folded position.

Thus, in a preferred manifestation of the present invention there is provided an apparatus wherein at each heating jaw or die, or at a member connected to each such jaw, there are connected two folding rods or levers, each having one respective end pivotably mounted to the associated heating jaw, whereas the other ends of the folding levers are each pivotably connected with the ends of the oppositely arranged folding lever of the other heating jaw, and in such a manner that these confronting ends mutually approach one another upon bringing together of the heating jaws, for the purpose of folding and maintaining in folded condition the wall of the packaging hose or tube.

Still further objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific example, while indicating a preferred embodiment of the invention, is given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

In the drawings:

FIGURE 1 is a plan view of the apparatus for folding and closing packaging hose designed according to the present invention and depicted in open position;

FIGURE 2 is a plan view of a packaging hose with inserted folding rods during heat-sealing or welding of the transverse seam, with the heating jaws not being shown;

FIGURE 3 is a side view of the hose shown in FIGURE 2, viewed in the direction of the arrow III thereof;

FIGURE 4 is a plan view of the apparatus illustrated in FIGURE 1 and shown in closed position;

FIGURE 5 is a cross-sectional view of the apparatus of the present invention taken along lines V—V of FIGURE 1; and

FIGURE 6 is a perspective view of the heating jaws and the folding levers.

Referring now to the drawings, and as can best be seen by inspecting FIGURES 1 and 4, the apparatus of the present invention is provided with two support carriages or slides **1***a*, **1***b* which are displaceably mounted upon two parallel rails **2**. In the illustrated embodiment, there is secured to each carriage **1***a*, **1***b* a connecting plate or angle bracket **3** (FIGURE 5) and a heating jaw or die **4***a* and **4***b*, respectively. The heating jaws **4***a*, **4***b* are heated in a manner known to the art, for example they are electrically heated. To both angle brackets **3** there are rotatably or pivotably connected the respective ends **5***a* of so-called folding levers or rods **5**, by means of suitable fastening members such as the rivets **6**. The free end **5***b* of each folding rod **5** is pivotably connected with the free end of the folding rod connected to the oppositely arranged heating jaw by means of a rivet **7**. The heating jaws **4***a*, **4***b* exhibit recesses **8***a*, **8***b*. In one of these recesses, such as recess **8***b* there is arranged a cutting instrument such as a knife **9**, adapted to be displaced by suitable actuating means (not shown) from the recess **8***b* into the recess **8***a* when the heating jaws **4***a*, **4***b* assume the position shown in FIGURE 4, more specifically, in the heat-sealing or welding position of said heating jaws.

The mode of operation of the apparatus hereinabove described is as follows: In the position shown in FIGURE 1, in which the heating jaws **4***a*, **4***b* together with their carriages **1***a*, **1***b* are spaced furthest from one another, the packaging tube or hose **10** shown in phantom, which either is completely formed of a thermoplastic material, e.g., polyethylene, or provided with a coating of such material, is filled by a suitable dosing or filling device not shown. Thereafter, the folding and closing operation begins, in that the two carriages **1***a*, **1***b* with the heating jaws **4***a*, **4***b* are moved towards one another. As a result, the confronting ends **5***b* of the folding rods **5** approach one another in a scissor-like manner, that is to say, they move against the outer wall of the packaging hose **10** and triangularly bend or fold the wall thereof, as can best be seen by referring to FIGURES 2 and 3.

When the heating dies **4***a*, **4***b* are completely pressed against one another, then the transverse seam is heat-sealed or welded, whereby the packaging tube **10** is tightly sealed. Thereafter, and with the heating dies **4***a*, **4***b* still pressed together, the cutting instrument or knife **9** is moved out of the recess **8***b* and, consequently, the hose **10** is severed or cut-through. The carriages **1***a*, **1***b* are then again moved into their starting position shown in FIGURE 1, and a new packaging hose **10** is placed between the heating dies **4***a*, **4***b*, whereupon the aforedescribed operation is repeated.

Depending upon the quality of the bag or container material, it can be advantageous to also arrange above the heating dies, symmetric to the plane of the cutting knife, identical folding rods 5. The apparatus is especially advantageous in those instances in which a packing hose is formed from an endless band which is then, in known manner, fused and filled at the bottom, whereupon the filled hose is advanced the length of the bag. The described apparatus can then serve to seal the upper bag opening.

Having thus described the present invention what is desired to be secured by United States Letters Patent, is:

1. Apparatus for folding and closing filled packaging hose formed of heat-sealable material, comprising a pair of oppositely arranged and movable heating jaws adapted to be heated and between which said packaging hose is capable of being located when said heating jaws are spaced from one another, a pair of infolding levers pivotably mounted adjacent to and connected with a respective end in operable relation to each heating jaw, there being a pair of infolding levers on each side of the location of said hose with the respective confronting ends of oppositely arranged infolding levers of each heating jaw being pivotably hinged to one another, in such a manner that said confronting pivotably hinged ends of said infolding levers approach one another upon movement of said heating jaws toward one another in order to infold the side wall of said hose at opposite points and maintain said packaging hose in position while said heating jaws engage and seal said package.

2. Apparatus according to claim 1, including at least a pair of parallel rails, and carriage means supported by said parallel rails and operatively connected with said heating jaws for permitting movement thereof toward and away from one another.

3. Apparatus according to claim 1, wherein at least one of said heating jaws is provided with a recess, and a cutting instrument mounted in said recess adapted for movement out of said recess.

4. Apparatus for folding and closing filled packaging hose formed of heat-sealable material, comprising a pair of oppositely arranged and movable heating jaws adapted to be heated and between which said packaging hose is adapted to be located when said heating jaws are spaced from one another, means operative with said heating jaws for permitting movement toward and away from one another, a pair of infolding levers connecting said heating jaws and arranged on opposite sides of the location of said hose, means pivotably mounting a respective end of each infolding lever to its associated heating jaw, and means pivotably connecting together the respective confronting ends of oppositely arranged infolding levers of each heating jaw, in such a manner that said confronting pivotably connected ends of said infolding levers approach one another upon movement of said heating jaws toward one another for infolding the side wall at diametrically opposed points, said hose being maintained in folded condition when located between said heating jaws until completion of a heat-sealing operation.

5. Apparatus for folding and closing filled packaging hose comprising a pair of oppositely arranged and movable jaw members between which said packaging hose is adapted to be positioned when said jaw members are spaced from one another, means for moving said jaw members toward and away from one another, a separate pair of infolding levers for each jaw member, means operatively connecting for pivotable movement a respective end of each pair of infolding levers to each jaw member, means pivotably connecting confronting ends of oppositely arranged infolding levers of each jaw member to one another, in such a manner that said confronting pivotably connected ends of said infolding levers approach one another in scissor-like manner upon movement of said jaw members toward one another in order to fold the side wall of said hose at opposed points in an inwardly extending direction and maintain in folded condition said packaging hose until completion of a sealing operation.

6. Apparatus according to claim 5; wherein said means operatively connecting a respective end of each pair of infolding levers to each jaw member includes a separate angle bracket supported by each jaw member and fastening means for pivotably connecting said respective folding lever ends to a respective angle bracket.

7. Apparatus according to claim 5; wherein said operatively connecting means includes fastening means for securing each pair of infolding levers directly to each associated jaw member.

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