

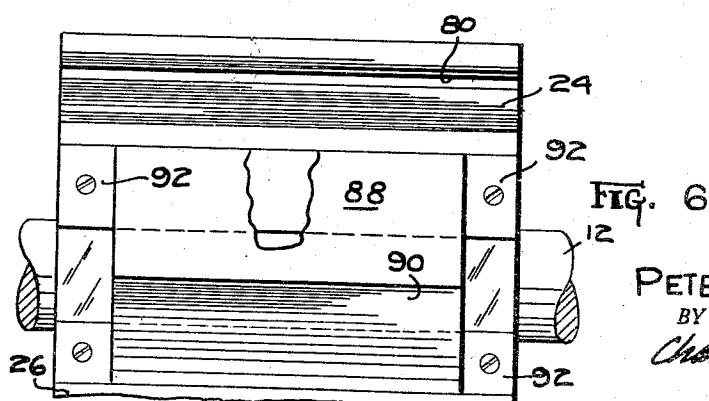
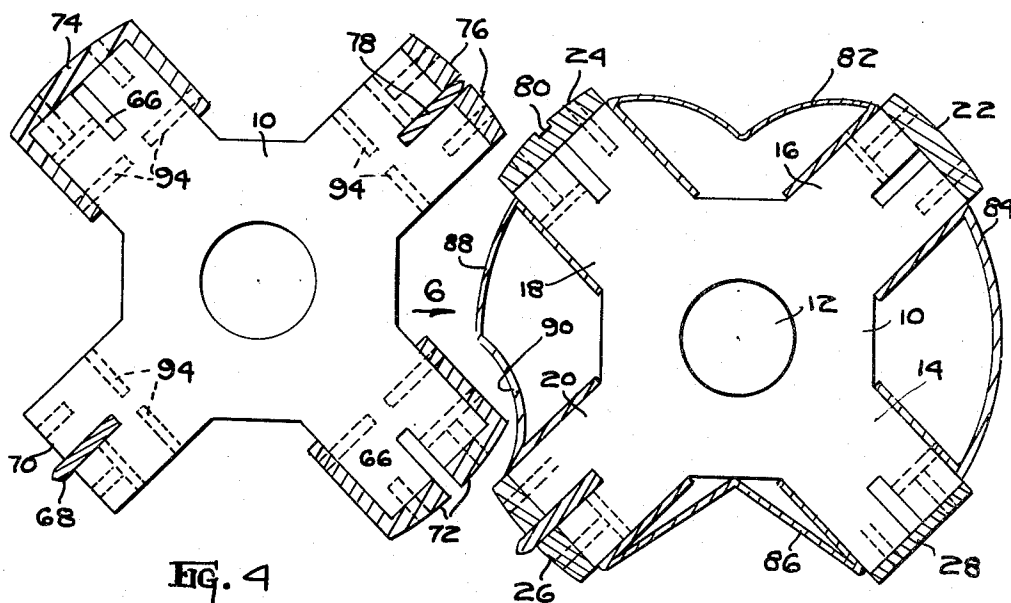
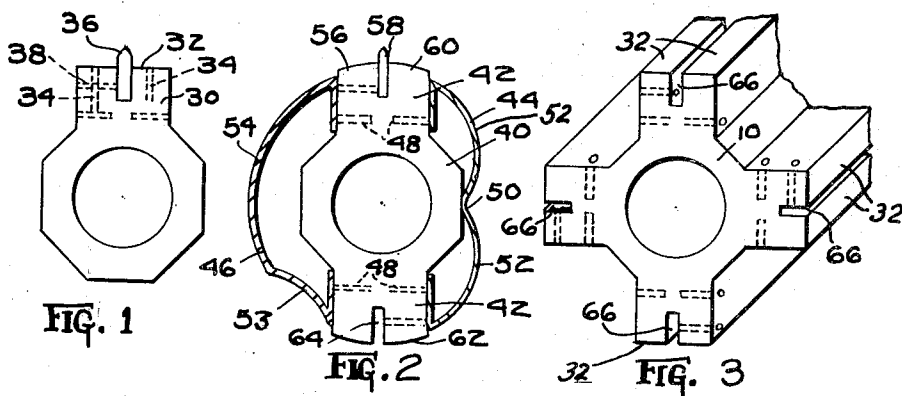
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ROTARY FORMING, SEALING AND CUTTING APPARATUS FOR CONTAINERS

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ROTARY FORMING, SEALING, AND CUTTING APPARATUS FOR CONTAINERS

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1 Claim. (Cl. 53—180)

This invention relates to a new and improved forming, sealing, and cutting, slitting or perforating apparatus or tool principally for use in the high speed manufacture of containers, etc., both during filling and in the absence of filling.

The principal object of the present invention resides in the provision of a device as above stated which comprises a body having a plurality of detachable and replaceable members which lend thereto the capacity to form a great many different sizes and shapes of bags, envelopes, etc.

Another object of the invention resides in the provision of a rotary forming tool comprising a body which is comparable to a spider and has a central arbor or shaft, the spider being provided with one or more arms extending radially thereof and terminating in end surfaces to which may be applied a great variety of sealing, crimping, cutting, perforating or slitting members; the provision of a device as described including replaceable forming or shaping members disposed between the arms of the spider above stated, said forming members being made in any shape required to perform the particular operation at hand and including members which have operating surfaces on arcs of circles, stepped surfaces for partial formation between the arms and partial expression of air or gas from the bag or envelope being made, and various shapes of concave surfaces, all of which, however, are generally adapted to cooperate with similar or complementary devices on a like forming device so that the same operate in pairs to form the bags or envelopes etc., shape them as desired, crimp and seal the same, and sever, perforate, or slit the container relative to the material being formed.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which

Fig. 1 is a view in end elevation of one form of the invention;

Fig. 2 shows a modification including the forming members in section;

Fig. 3 shows a four-armed device in perspective;

Fig. 4 is an end elevation of the device of Fig. 3 on an enlarged scale with different kinds of working members secured thereto;

Fig. 5 is similar to Fig. 4 but shows various forming members applied; and

Fig. 6 is an elevational view of one of the forming members looking in the direction of arrow 6 in Fig. 5.

It has been customary in the past in the container making and filling art to make single solid forming and sealing members according to the article to be packaged. This results in the necessity for the complete formation of a separate and new mandrel or tool, each time it is desired to package a different item or an article having a different shape or size. This invention provides a single device which may be varied and changed so as to ac-

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commodate a great many different conditions merely by the removal of and reapplication thereto of different members to be described.

Referring first to Fig. 5 it is to be understood that the main body 10 is elongated and adapted to rotate on a shaft or arbor 12 and has a plurality of arms 14, 16, 18 and 20 each provided with working elements generally indicated at 22, 24, 26 and 28. The character 28 actually indicates a non-working element, it being noted that it is flat and merely forms a platform. This platform might form a pressing medium for a cutoff knife or the like, however, making element 28 a working element in some cases. However, the elements 22, 24 and 26 are formed on the arcs of a circle having a center at the shaft axis, and these elements are sealing or crimping members which in cooperation with similar working members or other like tools form cross seals on advancing strips of material to form the same into a plurality of containers which may be cut off as desired.

The device shown in Fig. 1 has a single arm at 30 and this single arm as shown has a flat face 32 on which may be mounted by means, preferably of Allen head screws, in threaded holes 34 any one of a plurality of operating members which may be crimpers, sealers, etc., and which may or may not be provided with a knife 36, centrally thereof for slitting, perforating, or severing. The knife 36 may be held by a screw in a threaded hole 38.

Reference is now made to Fig. 2. It will be seen that the tool or device 40 therein shown is provided with two arms 42 which are just alike and detachably receive the same members as described above as to Figs. 1 and 5. In addition however, forming members 44, 46 are provided and these members are detachably secured as by screws at 48 to the body of the spider or tool member 40, between the arms 42.

The member 44 is formed on a double arc providing a recess at point or line 50 forming a receptacle as the tool rotates to receive articles to be packaged but to press the covering strips inwardly at the points 52. Both of the members 44 and 46 shape the advancing strip material before the package is closed, the member 46 having a step-down portion 53 receiving the article and advancing cover material, while the portion 54 thereof is used to flatten the remainder of the package before the member at 56 seals the top thereof, and a knife 58 if present cuts off the filled and finished package.

In succession, the crimping member at 60 forms the bottom of the package which is to be formed by member 44 as described, and the member at 62 forms the top cross seal finishing the package. However, in this case there is no knife in the slot 64 and therefore the finished package is not severed, assuming the device is rotating in a counterclockwise direction. However, a severing, slitting or perforating knife may be used or not as circumstances require.

In Fig. 3 there is shown the same body or spider 10 as is shown in Figs. 4 and 5 but with no detachable members secured thereto but showing the radial arms, flat attaching faces 32, and the knife slots 66 in each arm.

Fig. 4 shows the same spider or tool member as shown in Fig. 3 but in this case there is shown a bare knife at 68 which severs without crimping or sealing as the surface 70 is bare. This will form open ended envelopes. At 72 there are shown L-shaped extension width sealing or crimping faces which are clearly wider than those at 22, 24, 26. Here also the slot 66 is shown as vacant but severing, sealing or slitting knives could be inserted. Diametrically opposite from the members 72 there is a member 74 which is a U-shaped extension width sealing or crimping face, but no knife may be placed in the slot

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60 because the latter is covered. Another arrangement resides in the individual top and bottom sealers 76 spaced to receive a central knife 78 more nearly like the arrangement shown in Fig. 2 at 56, 58 and 60, but here the knife blade 78 is retracted so it does not operate, but still the slot is filled. Of course, it is to be understood that in the usual case each arm would in all probability be supplied with members the same as those on the other arms, but this is not necessarily the case and many times it will be found that variations are required, for instance in the case of making open-ended envelopes in pairs wherein the open ends of the envelopes face each other.

The element 22 is a sealing face with no knife possible; the element 24 is a double sealing face with a knife cutout 80 which cutout receives the knife, for instance, at 58 on the complementary roller of the roller pairs and occasions the cutting, slitting, or perforating. The reference numeral 26 shows substantially the same arrangement as that at 76 but in this case the knife extends outwardly to an operative cutting relation for cooperation with a cutout like that at 80 but on the cooperating member of the pair.

The different shapes of the members 82, 84, 86 and 88 are illustrative only, that at 82 being similar to that at 44 and that at 88 being similar to that at 46, although the article holding step down portion 90 in this case is relatively larger. The shape at 84 is used as complementary to a shape as at 82 for holding the article wholly to one side of a line between the roll pair, and the shape at 86 is used in formation of containers.

The various shapes 82, 84, 86, 88 are, of course not limited to those shown, but may assume any form desired. These shapes do not extend the width of the roll or body 10 but have extending wings as at 92 containing screws or the like for fastening into the tapped holes 94 which holes have been omitted from Fig. 5 for clarity in the illustration.

Reference is hereby made to my co-pending application Serial No. 194,659, filed November 8, 1950 (now abandoned) illustrating the uses to which the devices of the present nature may be put.

This machine will make at very high speeds any type of container of the tea bag, envelope, or tube type, and the length of any bag is unlimited as well as the width of any

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tube which is made in a direction parallel to the axes of the forming rollers. However, of course, these tubes may be made vertically or horizontally, i. e., transverse to the roll axes or parallel thereto.

The widths of horizontal tubes, the lengths of vertical tubes and bags is determined by the speed of the machine which in turn depends on the gearing thereof.

Furthermore, this invention provides forming rolls which can conform around any item or can be formed to the item or can be formed around it and also to it. Thus any size item may be packaged at high speeds, the cubic contents of any package, envelope or tube may be limited exactly as desired and when the container is formed to and around the item, the bag will have no capacity or cubic content at all except for the item covered. Furthermore, the crimping faces may be made in any shape desired and many irregular shaped containers are, therefore, possible to be made by this device.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed otherwise than as set forth in the claim, but what I claim is:

A container making apparatus comprising a cylindrical crimping and shaping tool including an arbor, a cylindrical body thereon for rotation therewith, a series of elongated longitudinally radial arms on the body, each arm having a face generally in a plane parallel to the arbor axis, a longitudinal replaceable crimping device on each of selected faces, means detachably securing the crimping devices in position, longitudinal detachable shaped shaping members secured to the body between each pair of arms, the shaping members being shorter than the body axially thereof, and wings thereon at the ends thereof providing easy attaching devices to the body of the tool.

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