

March 1, 1966

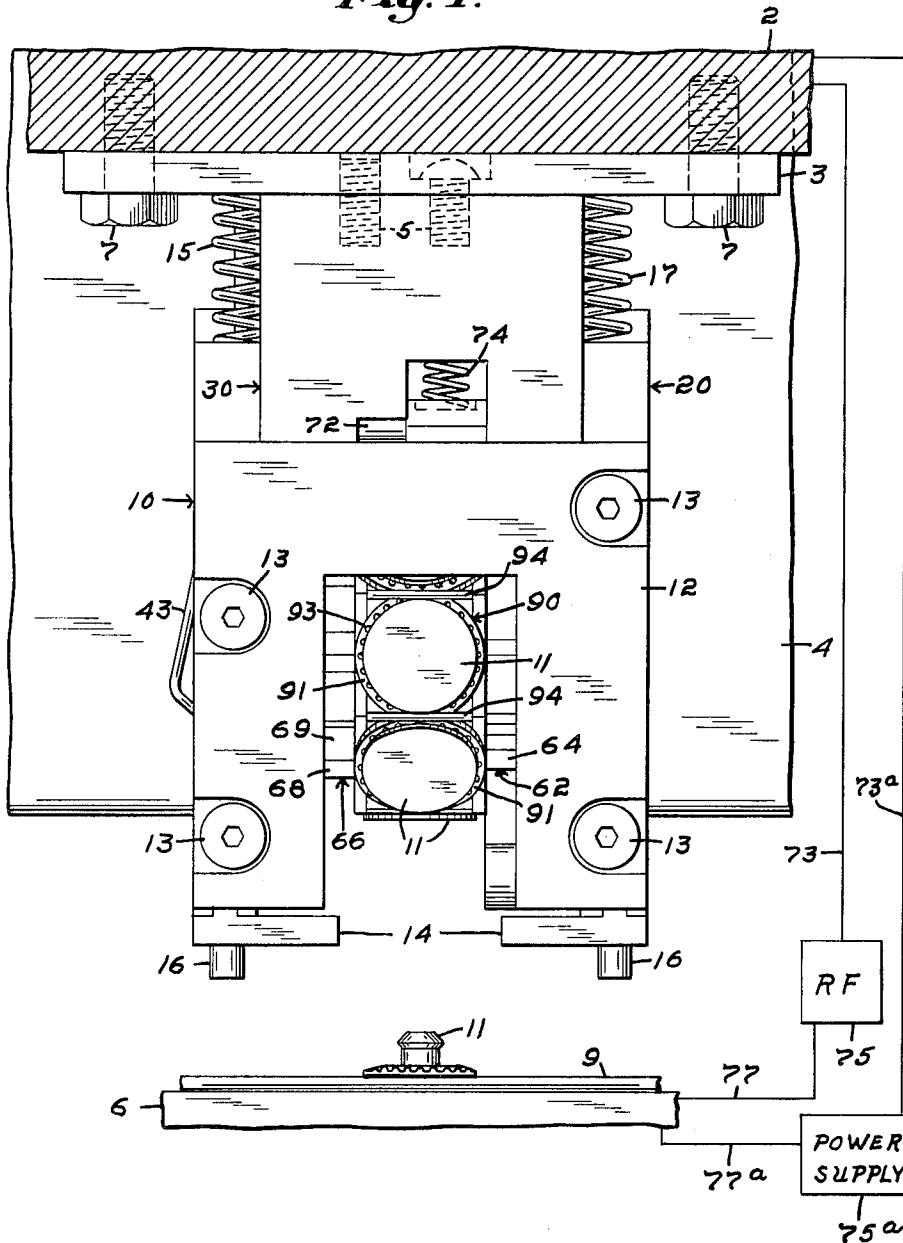
W. S. BACHMAN
FASTENER ATTACHING DEVICE

3,237,496

Filed April 30, 1964

4 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

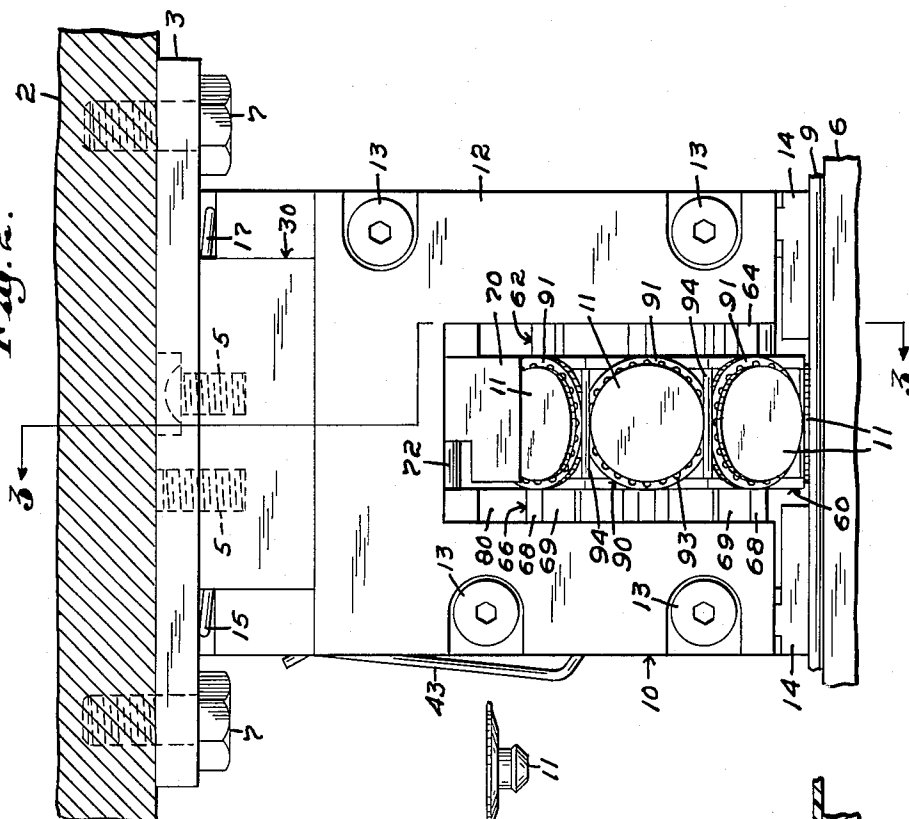
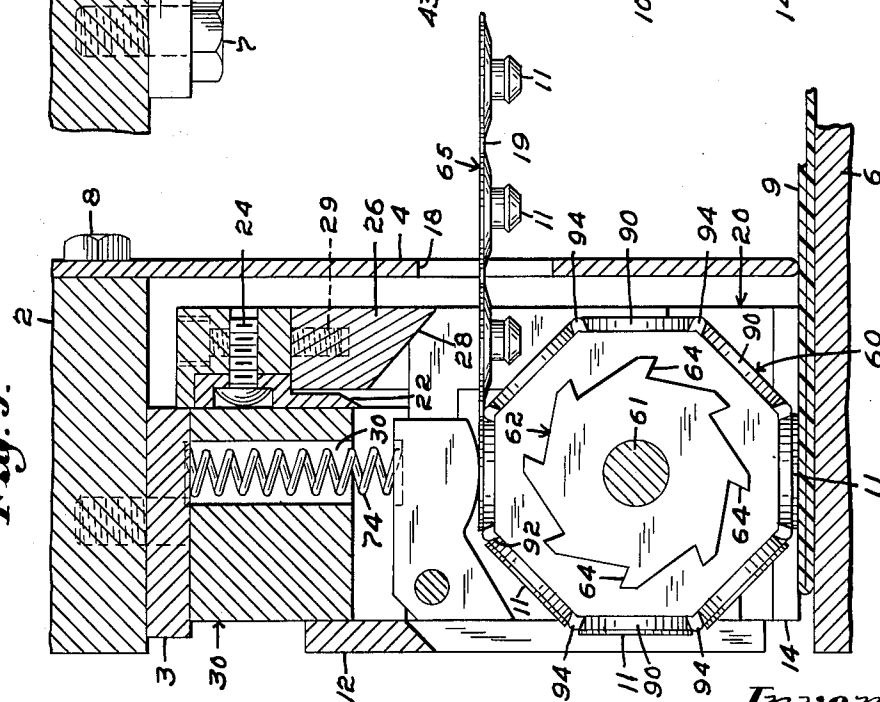


Fig. 3.



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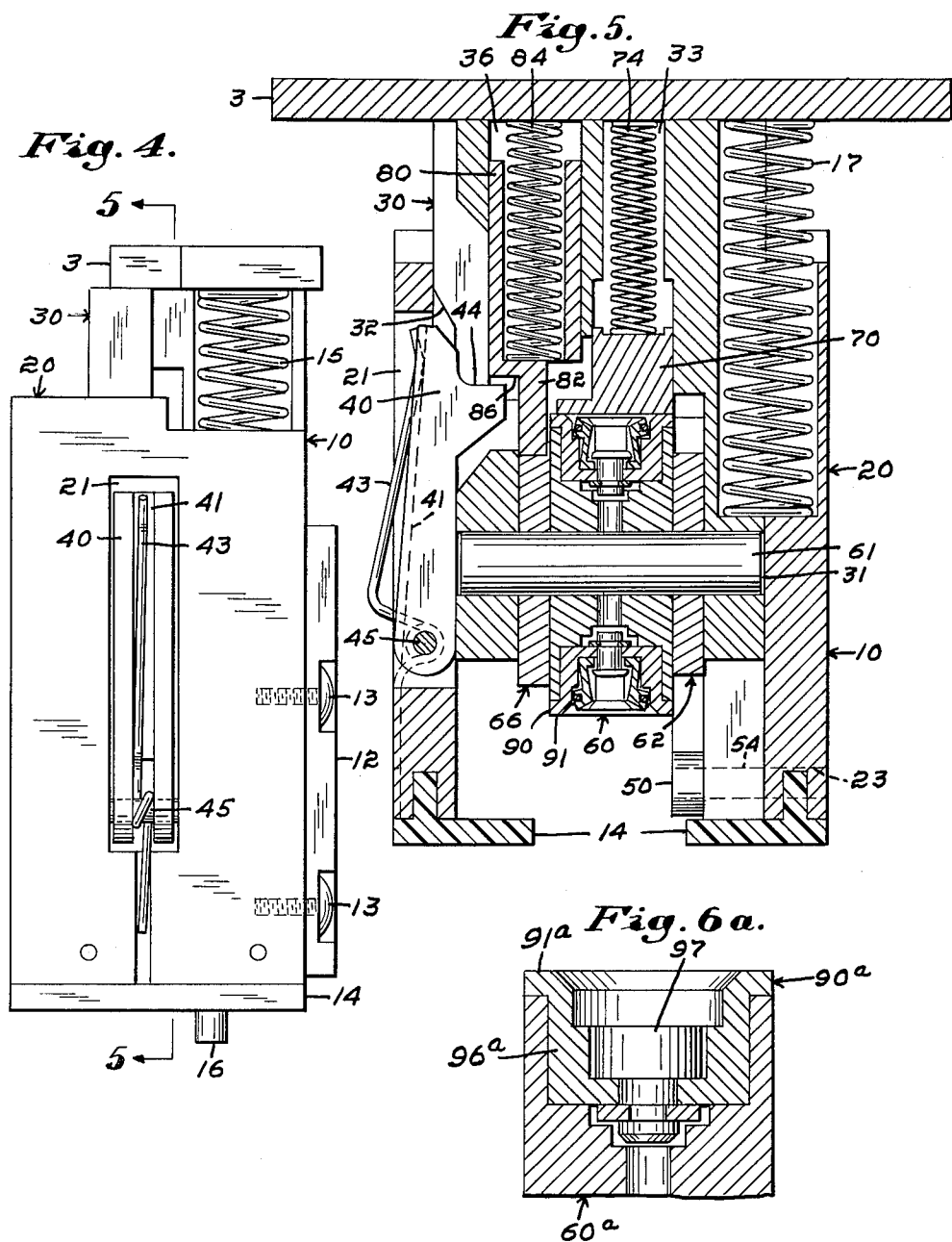
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Fig. 9.

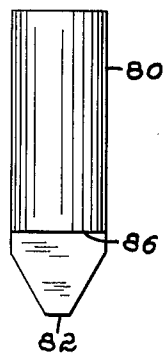


Fig. 6.

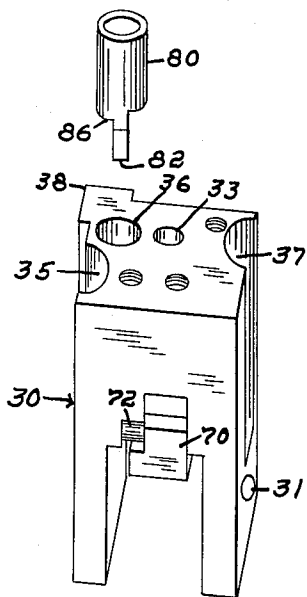
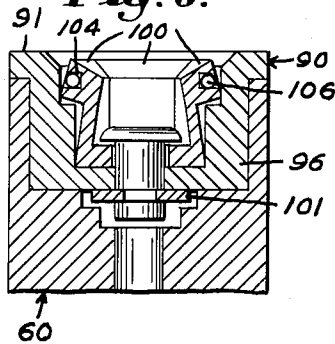


Fig. 10.

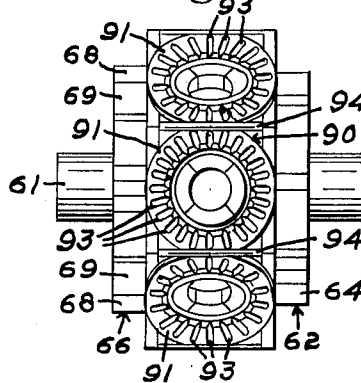
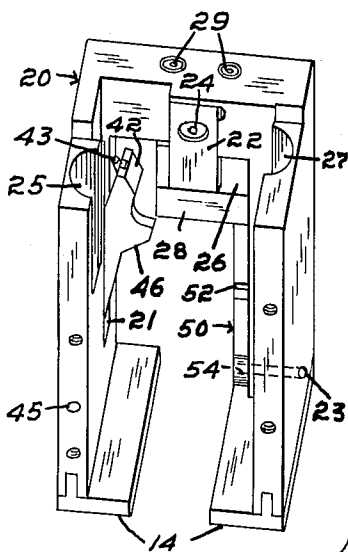
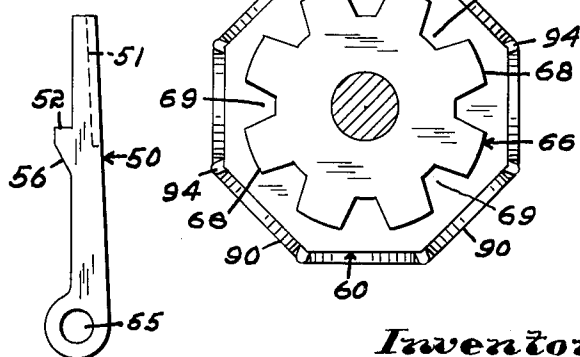


Fig. 7.

Fig. 11.

Fig. 8.



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3,237,496

FASTENER ATTACHING DEVICE

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Filed Apr. 30, 1964, Ser. No. 363,935

8 Claims. (Cl. 83-154)

The present invention relates generally to an improved device for attaching plastic snap fasteners to heat sealable plastic materials and other materials of commerce and, more particularly, to an improved snap fastener attaching device of the "positive action" type that may be removably mounted to a selected portion of any conventional heat sealing apparatus used in the manufacture of articles made from heat sealable materials. By the term "positive action" type, it is meant to define a device that "indexes" on the downward motion toward the work and immediately prior to the fastener applying operation as opposed to and distinguished from a device that "indexes" after the plastic snap fastener has already been attached to the article and the device is being moved away from the work. The term "indexing" is used in the art to define an operative action of a fastener attaching device by which a fastener stud or socket, fed into the device in a continuous strip form, is moved into position for attachment to the work.

Snap fastener attaching devices find important uses in the garment industry such as in the making of raincoats, baby clothes, etc. In the use of such garments, it is most desirable that the same may be easily and quickly fastened and unfastened about the user's body. This is most conveniently accomplished by having matching pairs of fastener studs and sockets respectively attached to opposing edges or in the plackets or slits of the garments at the places desired to be fastened. Another important use for snap fastener attaching devices is found in the billfold and purse industry in the manufacture of such items from heat sealable plastic sheeting materials.

Both in the garment industry and in the billfold industry, manufacturers heretofore were confronted with the necessity of submitting their products to a two-step operation: first to use a heat sealing apparatus to heat seal the edges and openings and second to attach the snap fasteners at the desired places by using another machine. The improved snap fastener attaching device of the invention has been designed to obviate this necessity for a two-step operation and to accomplish both the heat sealing operation and the attachment of the snap fasteners at about the same time and by the same operator. The result is increased efficiency of operation and reduced costs of manufacture, markedly enhancing the competitive position of the manufacturer. The snap fastener attaching device of the invention can, of course, be operated by itself, if so desired. For such independent operative application of the device, however, it becomes necessary to provide the device with its own supply of power. In its preferred application where one or more of such devices are operatively mounted onto selected portions of a conventional heat sealing apparatus, the operation of the heat sealing apparatus itself provides the power required for the operation of the device of the invention.

It is, therefore, a principal object of the present invention to provide an improved snap fastener attaching device.

More specifically, it is an object of the present invention to provide an improved device for attaching plastic snap fasteners to heat sealable plastic sheeting materials in a continuous manner and simultaneously with the heat sealing operation performed on the work.

It is another object of the present invention to provide

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an improved snap fastener attaching device of the "positive action" type that indexes as the device is moved toward the work and just prior to the fastener applying operation.

It is a further object of the present invention to provide a snap fastener attaching device that may be removably mounted to a selected portion of a conventional heat sealing apparatus, utilizing the power of the apparatus for the operation of the device.

It is still another object of the present invention to provide an improved snap fastener attaching device that may be used for attaching both snap fastener studs and sockets by being easily adaptable for conversion from attaching studs to attaching sockets.

It is a still further object of the present invention to provide an improved snap fastener attaching device for attaching fastener studs or sockets to heat sealable plastic sheeting materials in a relatively simple and inexpensive manner.

Other and further objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the improved snap fastener attaching device possessing the construction, combination of elements, and arrangement of parts which are exemplified in the following detailed disclosure, and the scope of which will be indicated in the appended claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawings wherein:

FIG. 1 is a front elevational view of a snap fastener attaching device constructed in accordance with and embodying the present invention and shown mounted to a selected portion (shown in section) of a conventional heat sealing apparatus together with a schematic representation of a high-frequency power supply used for operating the heat sealing apparatus and another power supply to operate the mechanical aspects of the device of the invention;

FIG. 2 is a view similar to that of FIG. 1 but showing the snap fastener attaching device of the invention in contact with the work and in the process of attaching a plastic snap fastener thereto;

FIG. 3 is a sectional view of the snap fastener attaching device taken along the line 3-3 of FIG. 2;

FIG. 4 is a side elevation of the snap fastener attaching device alone;

FIG. 5 is a front sectional view of the snap fastener attaching device taken along the line 5-5 of FIG. 4;

FIG. 6 represents a portion of the snap fastener attaching device as shown in FIG. 5 but on an enlarged scale depicting a snap fastener retaining and applying assembly used for applying fastener studs;

FIG. 6a is a view similar to that shown in FIG. 6 but showing a snap fastener retaining and applying assembly used for applying fastener sockets;

FIG. 7 is an exploded view, in perspective, of the operative parts of a snap fastener attaching device constructed in accordance with and embodying the present invention;

FIG. 8 is a view in elevation of the pawl;

FIG. 9 is a view in elevation of the plunger;

FIG. 10 is a front elevation of the rotary member, and

FIG. 11 is a side view, as seen from the left in FIG. 10, of the rotary member.

In general, the head 10 of the invention comprises: an outer member 20; an inner member 30 mounted for relative motion within the outer member 20; a rotary member 60 rotatably mounted in the inner member 30

and having a plurality of perimetrically positioned fastener applying portions 90 between the extended horizontal plane of the ratchet wheel portion 62 and the extended horizontal plane of the arrestor portion 66; a plunger 80 slidably mounted within the inner member 30 for co-operation with the arrestor portion 66; a lifter 40 pivotally mounted in the outer member 20 to co-operate with the plunger 80; and a pawl 50 pivotally mounted in the outer member 20 and provided with a tooth 52 to co-operate with the ratchet wheel portion 62.

For purposes of clarity of presentation, the head 10 of the invention is shown mounted to a portion of a conventional heat sealing apparatus in FIGS. 1 through 3 only, with the sealing bar of the heat sealing apparatus being shown in FIGS. 1 and 3 only.

Referring to the drawings in which like reference characters refer to like parts throughout and in particular to FIGS. 1 through 3, the reference character 10 denotes a head constructed in accordance with and embodying the present invention. The head 10 is shown mounted to a portion of the frame 2 of a conventional heat sealing apparatus by means of a suitable adapter plate 3 which is also a part of the head 10. The adapter plate 3 is secured to the head 10 by bolts 5—5 and to the frame 2 of the heat sealing apparatus by bolts 7—7. In FIGS. 1 and 3, there is also shown a portion of a heat sealing bar 4, also secured to the frame 2 by bolt 8 shown in FIG. 3. The function of the heat sealing bar 4 is to heat the edges, the openings and the plackets of articles formed of heat sealable plastic sheeting materials. A portion of such an article is denoted by the reference character 9 and is shown resting on a suitable press platen 6 of a conventional heat sealing apparatus. In the construction shown, the press platen 6 is stationary while the frame 2 of the apparatus is designed for reciprocal motion in a direction normal to the plane defined by the flat surface of the press platen 6. The power for the heat generating aspect of the heat sealing apparatus is provided by a high frequency power supply 75 shown connected by lead 73 to the frame 2 and by lead 77 to the press platen 6 of the heat sealing apparatus and the power for the other necessary operation is provided by the mechanical power supply 75a shown schematically corrected by a lead 73a to frame 2 and by lead 77a to the press platen 6. Furthermore, it should be understood that more than one such head 10 may be mounted at spaced intervals to the frame 2.

In FIG. 1, the work or article of manufacture 9 formed of an appropriate material and supported by the flat surface of the stationary press platen 6 is shown with a plastic snap fastener stud 11 already attached thereto. The head 10, on the other hand, is shown in its upward position and farthest removed from the press platen 6. Also, the head 10 as shown in FIG. 1 does not carry any snap fastener studs in the snap fastener retaining and applying portions 90—90. A front plate 12 is provided for the safety of the operator and it is shown secured by a series of bolts 13—13 to the outer member or housing 20 of the snap fastener attaching device 10 and the plate 12 also provides a guide means to prevent the other member 20 from shifting out of alignment with the inner member 30. The outer member of housing 20 is in turn provided with a pair of spaced, insulating, and work contacting feet or strippers 14—14, formed of an electrically insulating material. Each of the feet 14—14 is also provided with complementary strippers 16—16 respectively. The complementary strippers 16—16 are mounted under slight compression relative to the outer member 20 and within suitable cavities formed in the feet 14—14 and are designed to be received therein flush with the feet 14—14 when the latter are in contact with the work 9, as shown in FIGS. 2 and 3. The function of the complementary strippers 16—16 is to facilitate the separation of the pair of feet 14—14 from the work

9 after a snap fastener element has been attached thereto by the head 10.

Within the outer member or housing 20 is mounted an inner member or block 30. It should be noted that the inner member or block 30 is mounted within the outer member or housing 20 for reciprocal motion in translation and in a direction normal to the plane of the work contacting surfaces of the feet 14—14. It should also be noted that a pair of compression springs 15 and 17, defining a first compression means urge and normally hold the inner member or block 30 in co-operation with plate 3 within the outer member or housing 20 in an extended position and away from the pair of feet 14—14 as may be observed in FIG. 1.

The inner member or block 30 has a rotatably mounted therein at its end a rotary member 60 in proximity to the pair of feet 14—14. The rotary member 60 is provided with a plurality of fastener retaining and applying portions 90—90 perimetrically positioned about the rotary member 60 and between a ratchet wheel portion 62 and an arrestor or stabilizer portion 66 formed integral with the rotary member 60. The ratchet wheel portion 62 is in turn provided with a number of teeth 64, while the arrestor or stabilizer portion 66 is formed with a number of extensions or projections 68 defining a like number of depressions 69 therebetween. It is pointed out that the number of fastener applying portions 90—90 determines the number of teeth 64 of the ratchet wheel portion 62 as well as the number of the depressions 69 of the arrestor or stabilizer portion 66. It has been found that a rotary member 60 of octagonal configuration is desirable from the point of view of ease and efficiency of operation of the snap fastener attaching device 10 of the invention. The snap fastener applying portions 90—90 are separated from each other by a number of grooves 92 carrying plastic inserts 94. The various functions of the several above-enumerated parts of the rotary member 60 will be described in more detail below.

In FIGS. 2 and 3 is illustrated the process in which a plastic snap fastener stud 11 is attached to the work or article of manufacture 9 formed of heat sealable plastic sheeting material. As may be observed, the pair of sufficiently thick insulating and work contacting feet 14—14 of the snap fastener attaching device 10 are in contact with the work 9 and the complementary strippers 16—16 have been seated into their respective openings in the feet 14—14 and are flush with the work contacting surface thereof. A continuous strip 65 of snap fastener studs 11—11 that may be conveniently wound on a suitable feeding reel (not shown) positioned at a convenient distance from the head 10 is shown being fed into the device 10 from the rear and through a slot 18 formed in the sealing bar 4. A fastener positioner 26 having an inclined, beveled, slanted surface 28 and mounted at the rear upper end of the outer member 20 is provided to guide the snap fastener studs 11—11 into the snap fastener retaining and applying portions 90 of the rotary member 60. Adjacent the fastener positioner 26 is mounted a cutter member 22 whose function is to separate the snap fastener studs 11—11 one from the other at the narrow severable portions 19. The cutter member 22, in accomplishing its separation function, penetrates slightly into the grooves 92 and is supported therein by the plastic inserts 94. The plastic inserts are actually cutting blocks allowing the cutter member 22 to cut its own groove in each insert. To prevent the dislodgement of the snap fastener stud 11 in front of the cutter member 22 from within its snap fastener retaining and applying portion 90, a suitable pressing member 70 has been provided for co-operation with the snap fastener applying portions 90. The pressing member 70 is pivotally mounted about a pin 72 within the inner member 30 and cooperates with a compression spring 74 that

urges the pressing member 70 into contact with one of the fasteners 11—11 holding it within the applying portions 90, as may be observed in FIG. 3. As may be further seen in FIG. 3, simultaneously with the process by which a plastic snap fastener stud 11 is attached to the work 9 by the head 10 of the invention, the sealing bar 4 of the heat sealing apparatus accomplishes the heat sealing of the edges of the same work 9.

With particular reference to FIGS. 4, 5 and 9, a plunger 80 is shown mounted for reciprocal motion within a bore 36 of the inner member 30. The plunger 80 is preferably formed as a hollow cylinder having a tapered narrow end 82 designed for operative engagement with the depressions 69 of the arrestor or stabilizer portion 66 of the rotary member 60. A compression spring 84, defining a second compression means and carried within the cylindrical plunger 80, urges and normally holds the plunger 80 in locking engagement with the arrestor portion 66 of the rotary member 60. Such locking engagement inhibits the rotation of the rotary member 60 and stabilizes the fastener applying portions 90 with respect to the housing 20. A lifter member 40 is laterally and pivotally mounted about a pivot 45 in the outer member or housing 20. The lifter member 40 is provided with a lifting surface 44 to cooperate with surface 86 of the plunger 80. A torsion spring 43 wound about the pivot 45 extends within a slot 41 of the lifter 40 and urges and normally holds the lifting surface 44 in a position for engagement with the surface 86 of the plunger 80. When the inner member 30 is moved within the outer member 20 in a direction toward the pair of spaced feet 14—14, the lifting surface 44 of the lifter 40 engages the surface 86 of the plunger 80, lifting its tapered narrow end 82 from locking engagement with the stabilizer portion 66 of the rotary member 60. The rotary member 60 may then be rotated about its shaft 61, as will be explained below. On further motion of the inner member 30 within the outer member 20 toward the pair of spaced feet 14—14 the tapered surface 42 of the lifter 40 comes into contact with the tapered surface 32 provided by the inner member 30. The interaction of these two surfaces 32 and 42 gradually forces the removal of the lifting surface 44 from below the surface 86 of the plunger 80, allowing the tapered narrow end 82 thereof once again to assume its locking engagement with the stabilizer portion 66 of the rotary member 60 in co-operation with the second compression means 84, when the rotary member by other means has been sufficiently rotated.

The rotation of the rotary member 60 about its shaft 61 may best be described with reference to FIGS. 7, 8, and 10. An actuating member, such as a pawl 50, is pivotally mounted in the outer member 20 about a pin 54 designed to be received within a bore 23 of the outer member 20 and a hole 55 of the pawl 50. The actuating member 50 is provided with an actuating surface, such as a detent 52, to co-operate with the teeth 64 of the ratchet wheel portion 62 of the rotary member 60. A spring 53 secured to the outer member 20 and formed to fit within a depression 51 of the pawl 50 which is designed to urge and normally hold the detent 52 in a position for operative engagement with one of the teeth 64 of the ratchet wheel portion 62. When the inner member 30 is moved within the outer member 20 in a direction toward the pair of feet 14—14 and the lifter 40 has already released the plunger 80 from locking engagement with the stabilizer portion 66 of the rotary member 60, the detent 52 of the pawl 50 engages one of the teeth 64 of the ratchet wheel portion 62 and imparts thereby a predetermined degree of rotary motion to the rotary member 60. When the rotary member 60 has thus been turned, the next succeeding tooth 64 of the ratchet wheel portion 62 operates to push out the detent 52 of the pawl 50 by coming into contact with the beveled surface 56 thereof. Subse-

quent to sufficient rotation of the rotary member 60, the camming surface 42 of the lifter 40 engages the tapered surface 32 of the inner member 30, forcing the removal of the lifting surface 44 from below the surface 86 of the plunger 80. The plunger 80 is thus allowed to move forward within the bore 36 of the inner member 30 and its tapered narrow end 82 once again assumes its locking engagement with the stabilizer portion 66 of the rotary member 60.

The angular displacement of the rotary member 60 is such as to position another snap fastener applying portion 90 under the pressing member 70 as may be best observed in FIG. 3. Once the predetermined degree of angular displacement of the rotary member 60 has been completed as described above, the pressing member 70 is urged by the compression spring 74, defining the third compression means, into contact with the plastic snap fastener 11 carried by the fastener applying portion 90.

The third compression means 74 is accommodated within a bore 33 of the inner member 30, as may be best seen in FIGS. 3 and 7. The compression springs 15 and 17, defining the first compression means, are in turn accommodated in complementary pairs of channels 25 and 35, 27 and 37 respectively. Each of these channels represents a half circle in cross section, with the channels 25 and 27 being formed in the outer member 20 while the channels 35 and 37 are being formed in the inner member 30, as may be best observed in FIG. 7. Adjacent the channel 25 is provided a slot 21 to accommodate the lifter 40. At the rear upper end of the the outer member 20, the cutter blade 22 is secured thereto as by a bolt 24. The fastener positioner 26 is mounted adjacent the cutter 22 and is secured to the outer member 20 by a pair of bolts 29—29.

To facilitate the reciprocal motion in translation of the inner member 30 within the outer member 20, the inner member 30 is formed with a guide corner 38 whose tapered surface 32 is designed for co-operation with the tapered surface 42 of the lifter 40, as already explained above. A transverse bore 31 has been provided in the inner member 30 to accommodate the shaft 61 of the rotary member 60. In parallel spaced relation to the bore 31 is a bore 34 designed to receive the pin 72 of the pressing member 70. The second compression means 84 is designed to be received within the cylindrical plunger 80. The exploded view of the several above enumerated operative parts of the head 10 as shown in FIG. 7 demonstrates how those parts may be conveniently assembled.

FIG. 10 depicts the rotary member 60 in perspective and on an enlarged scale, showing the snap fastener applying portions 90 perimetrically positioned about the rotary member 60 and between the ratchet wheel portion 62 and the arrestor or stabilizer portion 66 formed integral with the rotary member 60. One may also observe the number of spaced grooves 92 separating the fastener applying portions 90 from each other and carrying the plastic inserts 94 therein. FIG. 11 represents a side view, as seen from the left in FIG. 10, of the rotary member 60, showing the arrestor or stabilizer portion 66 with its projections 68 defining depressions 69 therebetween.

FIG. 6 is a cross-section of a snap fastener applying position 90, as viewed on the section lines 6—6 of FIG. 11, depicting a snap fastener retaining and applying assembly on a much enlarged scale. It is pointed out that the fastener applying assembly shown in FIG. 6 is used for applying fastener studs 11 only. Such a snap fastener applying assembly comprises a hollow quasicylindrical member 96 of U-shaped cross-sectional configuration, four stud holder portions 100—100 shaped like petals of a flower, and a rivet shaped portion 108 anchoring the assembly within the rotary member 60. The hollow quasicylindrical member 96 is the one that conducts the current which heats the flange of a snap fastener stud 11

and electronically heat seals the same to the work 9. For this reason, cylindrical member 96 is preferably made of a good electrical conducting material such as beryllium-copper (BeCu) alloy which also has high thermal conductivity to efficiently cool the heated plastic. The stud holder portions 100—100 are each provided with an annular groove 104 to accommodate an annular spring 106 designed to hold the portions 100—100 together under slight tension and the portions 100—100 are shaped to allow pivoting for efficient collet movement. These are the portions that hold the snap fastener stud 11 in applying position within the assembly. The rivet portion 108 in turn anchors the stud holder portions 100—100 within the rotary member 60. A suitable clamp or C ring 101 is provided about the lower end of the rivet portion 108 and adjacent the member 96 to hold the assembly together.

In FIG. 6a there is illustrated a cross-section of a snap fastener retaining and applying portion 90a used for attaching plastic snap fastener sockets (not shown) only similar to the view shown in FIG. 6. The snap fastener applying assembly 90a comprises the same hollow quasi-cylindrical member 96 of U-shaped cross-sectional configuration as does the assembly 90 of FIG. 6 which is designed to accept and retain the socket in place. In lieu of the stud holder portions 100—100 there has been substituted a cylindrical stop 97 which is, in turn, held in place within the member 96 by a suitable ring 99, such as a Walde ring. As should be evident, the adaptation of the snap fastener attaching device 10 of the invention from attaching plastic snap fastener studs 11 to attaching plastic snap fastener sockets (not shown) is a relatively simple matter. It involves only the removal of the stud holder portions 100—100 and the portion 108 from within each of the fastener applying assemblies 90 and the substitution therefore of the stop 97 which prevents the plastic socket from distorting during heat sealing and the upper portion of the member 96 is formed to retain the socket.

The member 96 is formed with a flat surface 91 onto which any desired configurations, such as grooves 93 may be applied. These grooves 93, as may be clearly observed in FIG. 10, are designed to enhance the appearance of the snap fastener studs or sockets once they have been attached to an article of commerce by the snap fastener attaching device 10 of the invention. Many other configurations may be substituted for the grooves 93. One of the reasons that a change may be necessary in a member 96 is that the member 96 may be damaged by electrical arcing.

The operative application of the head 10 of the invention is as follows. One or more of such heads 10 is mounted by means of the adapter plate 3 to selected portions of the frame 2 of a conventional heat sealing apparatus, substantially as shown in FIGS. 1 through 3. The head 10 is then loaded with a continuous strip 65 of plastic snap fastener studs 11—11 (or plastic snap fastener sockets, not shown) from the rear and through the slot 18 of the sealing bar 4. When at least five of such fastener studs 11—11 are in their places in the fastener applying portions 90 of the rotary member 60, the head 10 is ready for the attaching operation. The operator or the machine then places the particular article of commerce 9 in position on the stationary press platen 6 and actuates the press. Thereupon, the frame 2 of the heat sealing apparatus begins to descend downwardly, carrying with it both the sealing bar 4 and the head 10 of the invention. When the pair of feet 14—14 have come to rest on the article of commerce 9, the further downward motion of the outer member or housing 20 is thereby arrested. The frame 2 of the heat sealing apparatus, however, continues its further downward descent, moving thereby the inner member 30 within the outer member 20 in a direction normal to and toward the pair of

spaced feet 14—14. Such translatory motion of the inner member 30 within and relative to the outer member 20 causes the lifter 40 to release the plunger 80 from locking engagement with the stabilizer portion 66 of the rotary member 60 in a manner already described above. On further relative motion of the inner member 30, the detent 52 of the pawl 50 imparts the predetermined degree of angular displacement to the rotary member 60 by acting on one of the teeth 64 of the ratchet wheel portion 62. At that point, the interaction of the tapered surfaces 42 and 32 causes the removal of the lifter 40 from the path of the plunger 80, permitting the plunger 80 to move forward and assume once again its locking engagement with the arrestor portion 66 of the rotary member 60. The head 10 of the invention has thus performed one "indexing," i.e., it has moved a new fastener stud 11 into position for attachment to the work 9. This new fastener stud 11 is, of course, in the fastener applying and retaining portion 90 that is now facing the work 9.

Immediately following the indexing and on a further and final relative motion of the inner member 30 within the outer member 20, the attachment of the plastic snap fastener stud 11 onto the work 9 is effected. This is accomplished by passing current through the frame 2, through the bed 10, and through the face of the rotary member 60, through the fastener 11 and the work 9 and thus through the bed 6 to the source. The heat causes the stud 11 to "flow out" from the applying portion 90. The heat and pressure then applied by the flat surface 91 onto the softened flange of the stud 11 causes the same to be sealed to the work 9. Simultaneously with the attachment of the stud 11 to the work 9, the sealing bar 4 of the heat sealing apparatus effects the heat sealing of the edge of the work 9, as may be best observed in FIG. 3. Following the attachment of the stud 11 and the heat sealing of the edge by the sealing bar 4, the frame 2 of the heat sealing apparatus commences to move upward and away from the press platen 6, by the mechanical power supply 75a. At this time while the outer member of housing 20 is held stationary against the work 9 through the feet 14 by the first compression means 15—17 while the inner member or block 30 moves away from the work 9 stripping the fastener from the holding portion 100—100. Subsequent to the "indexing" the stud 11 which is still on the strip and is second from the end and has been positioned below the tapered surface 28 and is pressed into a retaining and applying portion 90 by the surface 28 just prior to the cutting operation. The cutter 22 subsequently is caused to penetrate the underlying groove 92 and comes to rest on the plastic insert 94 carried within the groove 92. By so penetrating the groove 92, the cutter effectively severs the plastic snap fastener stud 11 that has now been moved from below the tapered surface 28 to below the pressing member 70 from the adjacent stud 11. Following the cutting operation the feet 14—14 are moved, complementary with the press to return to the starting position. The operator then removes the work 9 now completed and positions another article of commerce on the press platen 6. Thereupon a new cycle of operation, identical to that above described, is ready to commence to attach another plastic snap fastener stud 11 and to heat seal the edge of the work 9 now on the press platen 6.

It must be pointed out, that, if so desired, the snap fastener attaching device of the invention may be inverted and secured instead to the stationary press platen 6. In such applications, the work is positioned on top of the pair of feet 14—14 and the movable frame 2 of the heat sealing apparatus is caused to move against the feet 14—14.

The present invention thus provides an improved snap fastener attaching device of the positive action type that may be removably mounted to a conventional heat sealing apparatus used in the manufacture of articles of commerce.

Since certain changes may be made in the above described apparatus without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted in an illustrative and not in a limiting sense.

What is claimed:

1. A snap fastener attaching device comprising two members including a first member, a second member mounted within said first member, a rotary member rotatably mounted in said second member and having a plurality of perimetricaly positioned article applying portions linked to an indexing portion and an arrestor portion, an alignment means moveably mounted with said second member and formed to co-operate with said arrestor portion, and an actuating member mounted in said first member and provided with a means to co-operate with said indexing portion.

2. A snap fastener attaching device comprising an outer member, an inner member mounted for relative motion within said outer member, a rotary member rotatably mounted in said inner member and having a plurality of perimetricaly positioned fastener applying portions between a ratchet wheel portion and an arrestor portion, a plunger slidably mounted within said inner member and for co-operation with said arrestor portion, a lifter pivotally mounted in said outer member to co-operate with said plunger, and an actuating member pivotally mounted in said outer member and being provided with a ratchet to co-operate with said ratchet wheel portion.

3. A snap fastener attaching device comprising an outer member, an inner member mounted for relative motion in translation within said outer member, a rotary member rotatably mounted in said inner member and having a plurality of perimetricaly positioned fastener applying portions between a ratchet wheel portion and an arrestor portion, a plunger mounted for relative motion in translation within said inner member and for engagement with said arrestor portion, a lifter pivotally mounted in said outer member to co-operate with said plunger, and an actuating member pivotally mounted in said outer member and being provided with a ratchet to co-operate with said ratchet wheel portion, whereby when said inner member moves relative to said outer member said lifter lifts said plunger from engagement with said arrestor portion allowing thereby on further relative motion said actuating member to impart rotary motion to said rotary member.

4. A snap fastener attaching device comprising an outer member, an inner member mounted for relative motion in translation within said outer member, a rotary member rotatably mounted in said inner member and having a plurality of perimetricaly positioned fastener applying portions between a ratchet wheel portion and an arrestor portion integral with said rotary member, a plunger mounted for relative motion in translation within said inner member and for operative engagement with said arrestor portion of said rotary member, a lifter pivotally mounted in said outer member to co-operate with said plunger, and an actuating member pivotally mounted in said outer member and being provided with a ratchet designed to engage said ratchet wheel portion of said rotary member, whereby when said inner member moves relative to said outer member said lifter lifts said plunger from operative engagement with said arrestor portion of said rotary member allowing thereby on further relative motion of said inner member within said outer member said actuating member to impart rotary motion to said rotary member.

5. A snap fastener attaching device for use in combination with a heat sealing apparatus and comprising an outer member having a pair of insulating surfaces, an inner member mounted within said outer member for relative motion in translation normal to said pair of insulating surfaces, compression means urging said inner member away from said pair of insulating surfaces, a

rotary member rotatably mounted in said inner member and being provided with a plurality of fastener applying portions perimetricaly positioned about said rotary member between a ratchet wheel portion and a stabilizer portion thereof, a plunger slidably mounted within said inner member and for co-operation with said stabilizer portion, a spring member urging said plunger into locking engagement with said stabilizer portion of said rotary member, a lifter pivotally mounted in said outer member to co-operate with said plunger, an actuating member pivotally mounted in said outer member and being provided with a ratchet to cooperate with said ratchet wheel portion of said rotary member, whereby when said inner member moves relative to said outer member toward said pair of insulating surfaces said lifter releases said plunger from locking engagement with said stabilizer portion permitting thereby on further relative motion said actuating member to impart rotary motion through its said ratchet and said ratchet wheel portion to said rotary member, and means for removably mounting said device to a portion of a heat sealing apparatus.

6. A snap fastener attaching device for use in combination with a heat sealing apparatus and comprising an outer member having at one end thereof a pair of spaced insulating surfaces, an inner member mounted within said outer member through its free end thereof for relative motion in translation normal to said pair of spaced insulating surfaces, compression means urging said inner member away from said pair of spaced insulating surfaces, a rotary member rotatably mounted in said inner member in proximity with said pair of spaced insulating surfaces and being provided with a plurality of fastener applying portions perimetricaly positioned about said rotary member between a ratchet wheel portion and a stabilizer portion thereof, a plunger slidably mounted within said inner member and for co-operation with said stabilizer portion, a spring member urging said plunger into locking engagement with said stabilizer portion of said rotary member, a lifter pivotally mounted in said outer member to co-operate with said plunger, an actuating member pivotally mounted in said outer member and being provided with a ratchet to co-operate with said ratchet wheel portion of said rotary member, whereby when said inner member is moved within and relative to said outer member in a direction normal to and toward said pair of spaced insulating surfaces said lifter removes said plunger from locking engagement with said stabilizer portion permitting thereby on further relative motion said actuating member to impart a predetermined degree of rotary motion to said rotary member, and means for removably mounting said device at its end away from and in a plane parallel with said pair of spaced insulating surfaces to a selected portion of a heat sealing apparatus.

7. A snap fastener attaching device for use in combination with a heat sealing apparatus and comprising a housing having a pair of spaced insulating layers secured to one end thereof, a block member mounted within said housing for reciprocal motion in translation normal to the plane of said pair of spaced insulating layers, a first compression means urging and normally holding said block member in an extended position away from said pair of spaced insulating layers, a rotary member mounted for rotation in said block member and being provided with a number of fastener applying portions perimetricaly positioned about said rotary member and between a ratchet wheel portion and a stabilizer portion integral with said rotary member, a plunger mounted within said block member for reciprocal motion in translation and for operative engagement with said stabilizer portion of said rotary member, a second compression means urging and normally holding said plunger in locking engagement with said stabilizer portion of said rotary member, a lifter pivotally mounted in said hous-

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ing and for co-operation with said plunger, a pawl pivotally mounted in said housing and being provided with a ratchet for co-operation with said ratchet wheel portion of said rotary member, whereby when said block member is moved within said housing in a direction normal to and toward said pair of spaced insulating layers said lifter releases said plunger from locking engagement with said stabilizer portion permitting thereby on further relative motion said pawl to impart a predetermined degree of rotary motion to said rotary member, and means for removably mounting said device at its end away from and in a plane parallel with said pair of spaced insulating layers to a selected portion of a heat sealing apparatus.

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8. The snap fastener attaching device as defined in claim 7 being further characterized in that said housing is also being provided with a fastener position having a tapered surface and a cutter member mounted adjacent said tapered surface, and said block member is also being provided with a pressing member pivotally mounted within said block member and a compression spring urging said pressing member into contact with one of said number of fastener applying portions perimetrically positioned about said rotary member.

No references cited.

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