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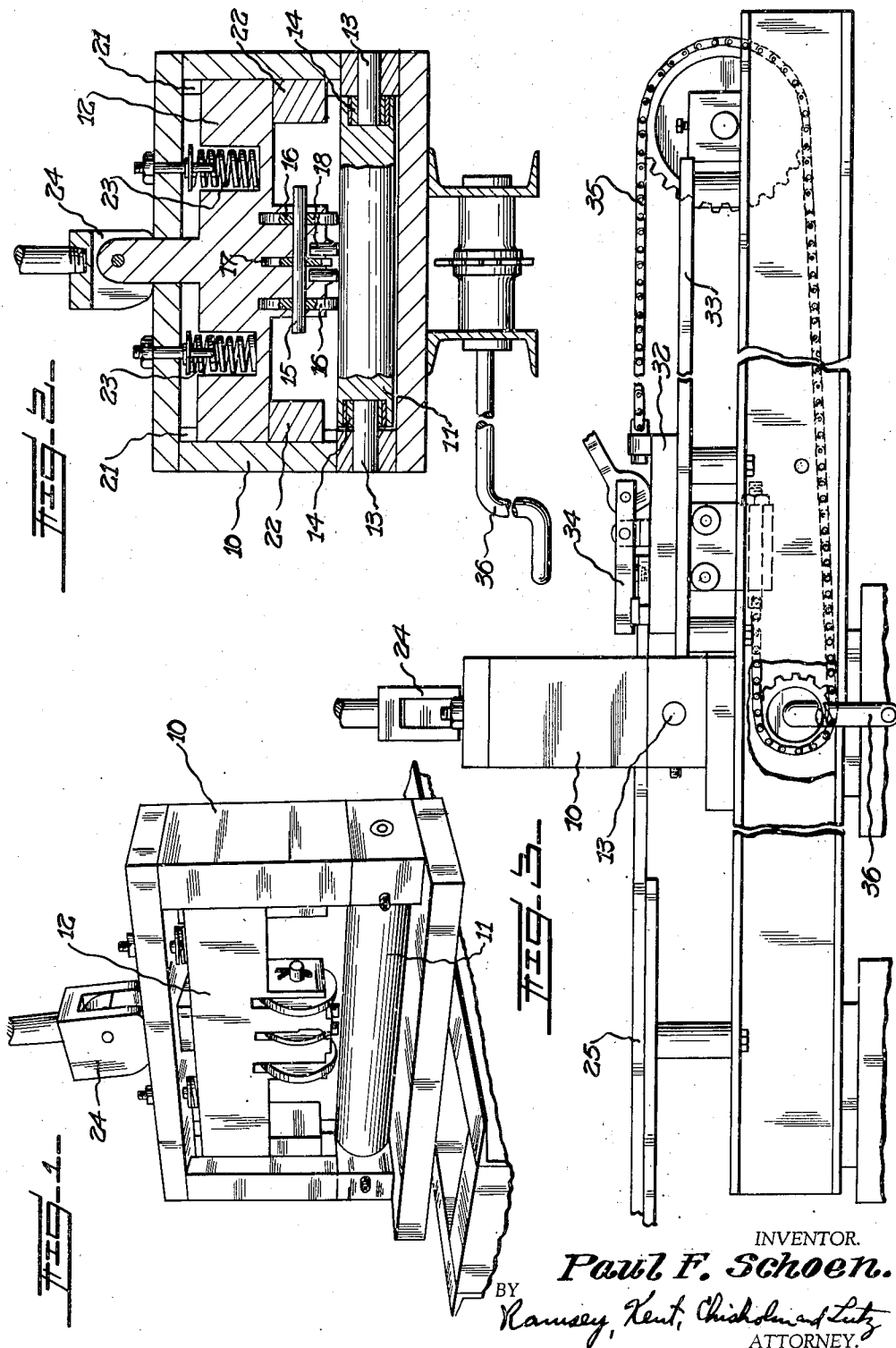
P. F. SCHOEN

2,227,947

CLIP CRIMPING MACHINE

Filed Aug. 25, 1938

2 Sheets-Sheet 1



INVENTOR.

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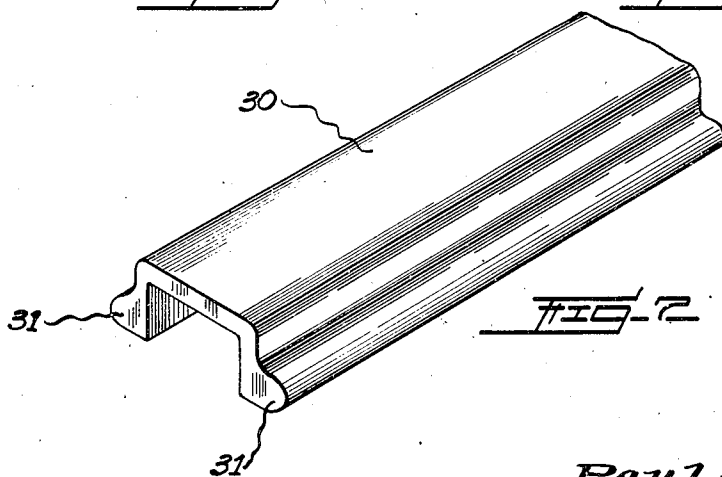
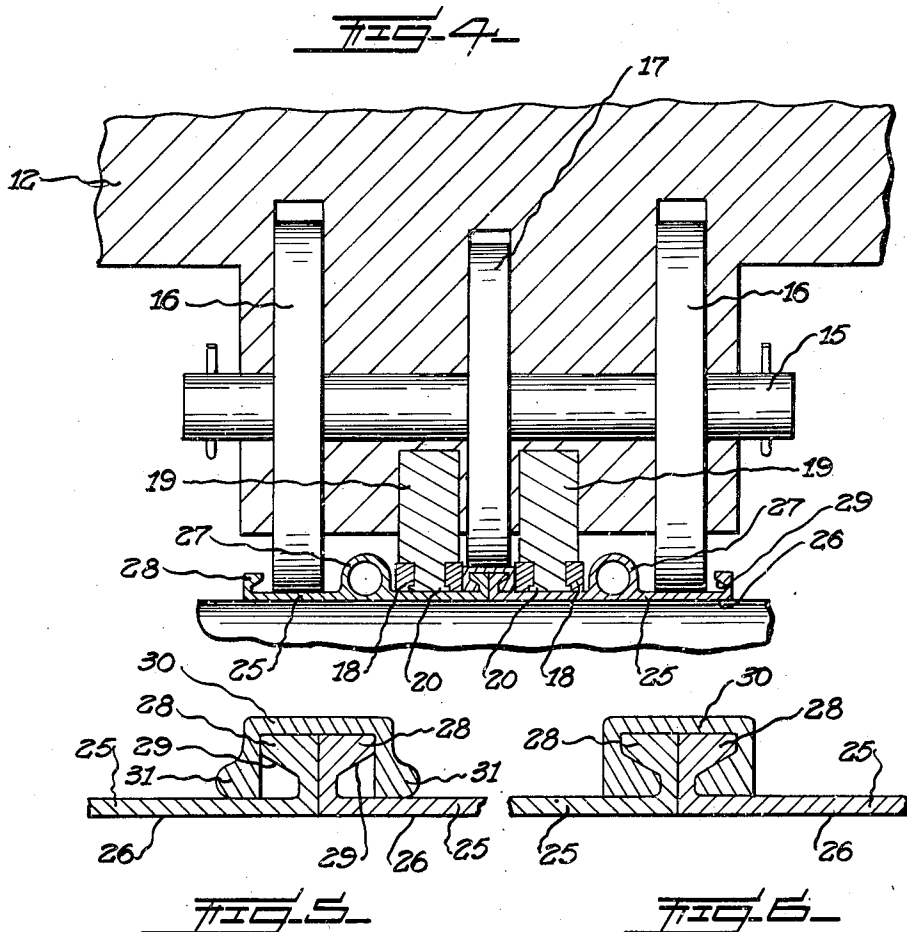
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# CLIP CRIMPING MACHINE

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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

2,227,947

## CLIP CRIMPING MACHINE

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5 Claims. (Cl. 80—1)

This invention relates to a clip-crimping machine which is designed to crimp a substantially U-shaped clip strip upon adjacent flanges of separate flanged strips in order to firmly unite the flanged strips into a substantially unitary structure.

The flanged strips are extruded from aluminum, or similar material, and it is desired to unite two or more of them into a unitary structure suitable for use in refrigerators, or similar installations. The machine of the present invention provides a simple and efficient means for uniting such strips with a clip-strip at a single pass through the machine.

Other objects and advantages of the invention will become apparent as the description proceeds. While a preferred form of the machine is referred to herein for purposes of illustration, it should be understood that various changes may be made without departing from the spirit of the invention.

In the drawings:

Fig. 1 is a perspective view of the main operating part of the machine.

Fig. 2 is a vertical cross-section of the part shown in Fig. 1.

Fig. 3 is a side elevation of the machine.

Fig. 4 is an enlarged cross-section of part of the machine.

Fig. 5 is an enlarged fragmentary cross-section illustrating the position of the clip-strip and the adjacent flanges prior to passing the parts through the machine.

Fig. 6 is a view similar to Fig. 5 showing the position of the parts after passage through the machine.

Fig. 7 is an isometric view of the end of a clip-strip.

Referring to the drawings more particularly, the main part of the machine comprises a frame 10 in which a base roller 11 is mounted on a horizontal axis. A head 12 is movable vertically in the frame 10, and carries the operating rollers as will be described more particularly hereafter.

Referring to Fig. 2, it will be seen that the base roller 11 revolves on pintles 13, suitable bearing bushings 14 being interposed between the rollers 11 and pintles 13. The movable head 12 carries in its lower part a shaft 15 which is horizontal and parallel to the axis of base roller 11. Mounted on shaft 15 are two hold-down rollers 16. A presser roller 17 is mounted between the hold-down rollers 16 and is of smaller diameter than hold-down rollers 16. A pair of crimping rollers 18 are mounted on vertical axes, one on each side of the presser roller 17. As illustrated more par-

ticularly in Fig. 4, each of the crimping rollers 18 is rotatably mounted on the stud 19 and is held against vertical displacement by a peened-over head 20, the stud engaging a recess in the lower face of roller 18.

The lateral sides of head 12 are confined in guide-ways 21 formed in frame 10, and guide-blocks 22 are secured to the lower part of head 12 to assist in aligning it. The head 12 is normally biased downwardly toward the base roller in any suitable manner, such as the springs 23, and suitable means such as cam 24 is provided for elevating the head 12 when desired.

The strips 25 which are to be united in this machine, as illustrated in cross-section in Fig. 4, have a flat lower face 26 and an upwardly extending tubular body 27. Lateral flanges 28 extend upwardly along each edge of the strip, and each of these flanges is undercut along its inner face as indicated at 29. Strips of this shape are extruded from aluminum, or similar material, particularly for use in refrigeration units, and it is necessary to unite them in side by side relation in order to build up a cooler unit or other suitable heat exchange unit. The present machine provides a simple and expeditious method of mechanically uniting the adjacent flanges of two strips by crimping a clip-strip upon them.

The clip-strip 30, also extruded from aluminum, is illustrated in Fig. 7 in its original condition, and it will be seen that it has a substantially U-shaped interior contour, and that its exterior contour is also substantially U-shaped except for the laterally projecting ribs 31 on the outside of the downwardly extending walls of the clip-strip. These ribs 31 provide excess material which is deformed into the undercut grooves 29 of flanges 28, as will hereafter appear.

Prior to operation of the machine, two of the flanged strips 25 are assembled in the side by side relation illustrated in Fig. 4, and a clip-strip 30 is then laid over the adjacent flanges 28 to the position illustrated in Fig. 5. By a suitable manual instrument the sides of clip-strip 30 are compressed for a short distance at the lead end of the strip, deforming the ribs 31 into the undercut grooves 29, thus straightening the sides of clip-strip 30 and causing the excess material of ribs 31 to substantially fill the undercut grooves 29, as illustrated in Fig. 6.

After the lead end of the strips has thus suitably been prepared, the head 12 is moved to its raised position by operation of cam 24. The prepared end of the strips is then inserted between base roller 11 and the rollers carried by movable

head 12, and the cam 24 is then released permitting springs 23 to strongly press the movable head down upon the strips. The machine is now in the operative position illustrated in detail in Fig. 4, in which hold-down rollers 16 engage the upper flat surfaces of strips 25 between the tubular bodies 27 and the outside lateral flanges 28; the presser roller 17 presses upon the top of clip-strip 30; and the two crimping rollers 18 closely engage the lateral straight sides of clip-strip 30 but have their lower ends sufficiently elevated so as to avoid frictional contact with the upper faces of strips 25. With the parts in this position, the strips are now drawn through the machine by any suitable mechanism, and in this drawing operation rollers 18 continue the previously started operation of deforming flanges 31 inwardly, thus crimping the clip-strip upon flanges 28 in the manner illustrated in Fig. 6 for the full length of the strips to be united.

It will be clear that the upper surface of base roller 11 provides means for maintaining the lower faces 26 of strips 25 in the same plane, and that such alignment is assured by the downward pressure of hold-down rollers 16 and presser rollers 17. It will be clear, since the strips being operated upon are engaged solely by rollers during their passage through the machine, the frictional resistance is reduced to a minimum. It will, of course, be understood that some or all of these rollers could be replaced by stationary parts pressing against the strips, but such substitution would, of course, increase the frictional resistance and hence the power needed to operate the machine. It should also be understood that while the machine illustrated is designed to unite only two strips 25, the machine could by addition of suitable rollers be adapted to unite any desired number of strips simultaneously.

Any suitable means can be used for drawing the strips through the machine, one form being illustrated in Fig. 3 in which a drawing head 32 is movable along a table 33. The lead end of strips 25 after having been prepared as above described and threaded through the rollers is secured to the drawing head 32 by clamp 34. After the rollers have been moved to the operative position previously described, the drawing head is moved toward the right of Figure 3 by means of chain 35 operated by crank 36. Any other preferred manual or power means could, of course, be used to move drawing head 32.

I claim:

1. A clip-crimping machine adapted to crimp a clip-strip having a generally U-shaped cross-section upon adjacent undercut flanges of separate flanged strips, said machine comprising a base roller upon which the lower side of the flanged strips is supported, a presser roller pressing the clip-strip down upon the flanges of the flanged strips, a crimping roller mounted on each side of the presser roller, the crimping rollers engaging the sides of the clip-strip and pressing them into the grooves of the undercut flanges, hold-down means engaging the upper surface of the flanged strips and holding them against the base roller, and means for drawing the work pieces through the machine.

2. A clip-crimping machine adapted to crimp a clip-strip having a generally U-shaped cross-section upon adjacent undercut flanges of separate flanged strips, said machine comprising a base roller upon which the lower side of the flanged strips is supported, a presser roller pressing the

clip-strip down upon the flanges of the flanged strips, a crimping roller mounted on each side of the presser roller, the crimping rollers engaging the sides of the clip-strip and pressing them into the grooves of the undercut flanges, a hold-down roller on each side of the crimping rollers, the hold-down rollers engaging the upper surface of the flanged strips and holding them against the base roller, and means for drawing the work pieces through the machine.

3. A clip-crimping machine adapted to engage a clip-strip having a generally U-shaped cross-section with ribs projecting from its sides and to crimp the sides of the clip-strip into holding engagement with adjacent undercut flanges of separate flanged strips, said machine comprising a base roller mounted on a horizontal axis and supporting the flat lower side of the flanged strips, a presser roller mounted on a horizontal axis and pressing the clip-strip down upon the flanges of the flanged strip, a crimping roller mounted on a vertical axis on each side of the presser roller, the crimping rollers engaging the sides of the clip-strip and distorting the ribs of the clip-strip into the grooves formed by the undercut flanges, a hold-down roller mounted on a horizontal axis on each side of the crimping rollers, the hold-down rollers engaging the upper surface of the flanged strips and pressing them against the base roller, and means for drawing the work pieces through the machine.

4. A clip-crimping machine comprising a frame, a base roller mounted on a horizontal axis in the frame, a head movable in the frame and biased downwardly toward the base roller during normal operation of the machine, means for holding the head in a position elevated from the base roller while work pieces are being assembled in the machine, a plurality of hold-down rollers mounted in the head on a horizontal axis and adapted to assume a work position close to the surface of the base roller, a presser roller mounted in the head on a horizontal axis and located between the hold-down rollers, the presser roller being spaced from the base roller a greater distance than are the hold-down rollers, and a pair of crimping rollers, one of the crimping rollers being mounted on each side of the presser roller, the crimping rollers being mounted on vertical axes and projecting toward the base roller substantially as far as do the hold-down rollers.

5. A clip-crimping machine comprising a frame, a base roller mounted on a horizontal axis in the frame, a head movable in the frame and spring biased downwardly toward the base roller during normal operation of the machine, cam means for holding the head in a position elevated from the base roller while work pieces are being assembled in the machine, a plurality of hold-down rollers mounted in the head on a horizontal axis and adapted to assume a work position close to the surface of the base roller, a presser roller mounted in the head on a horizontal axis and located between the hold-down rollers, the periphery of the presser roller being spaced from the base roller a greater distance than are the hold-down rollers, a pair of crimping rollers, one of the crimping rollers being mounted on each side of the presser roller, the crimping rollers being mounted on vertical axes and projecting toward the base roller substantially as far as do the hold-down rollers, and means for drawing the work pieces through the machine.

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