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CONTINUOUS BAND HEAT SEALING MACHINE

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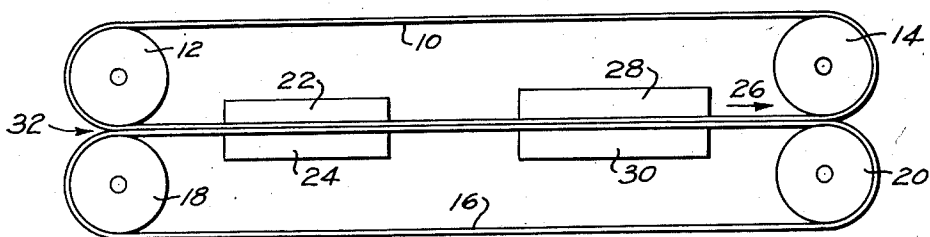


Fig. 1

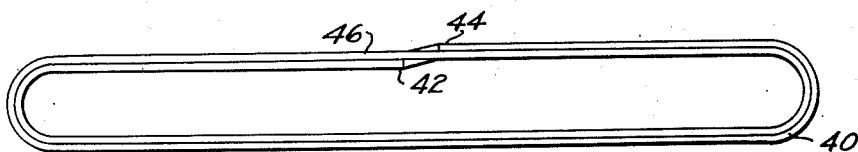


Fig. 2

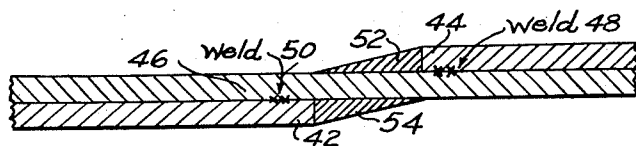


Fig. 3

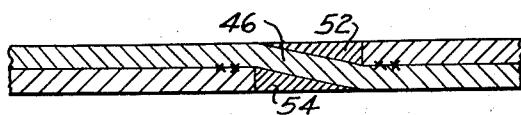


Fig. 4

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CONTINUOUS BAND HEAT SEALING MACHINE

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5 Claims. (Cl. 154—42)

It is an object of this invention to provide an improved heat sealing machine of the type known in the trade as a "continuous band sealer."

It is a further object of this invention to provide in a machine as aforesaid an improved band which will have a much longer life than those currently in use.

It is a further object of this invention to provide an improved form of splice in a band as aforesaid, which form of splice contributes greatly to the improved results aforesaid.

The above and other objects will be made clear from the following detailed description taken in connection with the annexed drawings, in which:

Figure 1 is a schematic view of a continuous band filler;

Figure 2 is an illustration of the convolute type of band herein contemplated;

Figure 3 is a greatly enlarged view of the improved splice as originally formed; and

Figure 4 is a view similar to Figure 3 but showing the final condition of the splice.

Subject to numerous mechanical variations the fundamentals of the continuous band sealer are illustrated in Figure 1 in which a metal belt 10 passes around pulleys 12 and 14 and a second belt 16 passes around pulleys 18 and 20. A heated jaw 22 presses against the inner side of the belt 10 and is opposed by a heated jaw 24 pressing against the inner side of the belt 16. The travel of the belts is in the direction of the arrow 26. The heated jaws 22 and 24 are followed by a cooled jaw 28 pressing against the inside of the belt 10 and another cooled jaw 30 pressing against the inside of the belt 16. The material to be sealed is fed into the machine at 32. The metal belts 10 and 16 transmit to this material the heat of the jaws 22 and 24, bringing the material to a sealing temperature. These belts then permit cooling by means of the jaws 28 and 30 to coalesce the seal.

For a variety of technical reasons which need not be stated here, it has been found that the ideal caliper of the steel belts is .006 inch and heretofore the belts have been formed by butt-welding the ends of such a strip of steel. Such butt-welds, however, do not stand up under the flexing involved in going around the pulleys with the result that frequent shutdowns have been necessary in order to re-weld the belts. It has also been attempted to overlap the ends and spot weld them. This, however, produces a "lump" of .012 inch caliper which can be very objectionable in the sealing of homogenous films.

The primary basis of the present invention is illustrated in Figure 2 in which a strip of steel 40 is convolutely

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wound to bring one end 42 on the inside and the opposite end 44 on the outside. This strip is made one-half the usual thickness, say, .003 inch. The ends 42 and 44 therefore lie on opposite sides of a portion 46 of the strip 40.

Referring now to Figure 3 it will be noted that the ends 42 and 44 are slightly spaced apart along the portion 46. The end 44 is spot welded at 48 to the portion 46 while the end 42 is spot welded at 50 to the portion 46. A filling of high melting point solder 52 forms a bevel from the upper edge of the end 44 to the surface of the portion 46 and the upper surface of the solder 52 meets the surface 46 at a point adjacent the extremity of the end 42. A similar body of high melting point solder 54 extends from the outer corner of the end 42 and meets the inner side of the strip 46 adjacent the extremity of the end 44. Additional spot welds may be made between the plies at various points around its circumference.

If desired, the splice illustrated in Figure 3 may be pressed to the condition illustrated in Figure 4 but in many cases this will not be necessary since the splice would assume the form of Figure 4 after a short period of actual use on the machine illustrated in Figure 1.

In effect there are two splices each one-half the thickness of the conventional splice and since stresses induced in a rectangular section as a result of flexure vary as the cube of the thickness and where, as here, the reduction is fifty percent, the maximum induced stress for a given flexure is only one-eighth that of the original belt. Accordingly, therefore, it becomes possible to reduce the diameter of the pulleys and therefore the overall size and cost of the machine while still keeping maximum stress at a lower value than occurs in current practice or, conversely, retaining the same pulley diameter, the life of the belt and the splice is greatly increased.

What is claimed is:

1. A heat sealing machine comprising: opposed pairs of pulleys; a pair of belts each passing around one pair of pulleys to define a work sealing path; heated jaws pressed against opposite sides of said belts adjacent the entering end of said path; cooling jaws pressed against opposite sides of said belts adjacent the exit end of said path, each of said belts comprising a convolution of thin sheet metal having its ends juxtaposed and secured to opposite sides of the adjacent body of the belt.

2. For use on a heat sealing machine of the continuous band type, a flexible, power-delivering belt comprising a narrow strip of thin sheet metal convolutely wound with the convolutions in intimate contact, the ends of said strip being juxtaposed on opposite sides of the body of the strip and being secured thereto.

3. A belt as set forth in claim 2 in which the ends are secured by spot welding.

4. A belt as set forth in claim 3 in which a body of solder tapers from each of said ends to the adjacent surface of the belt.

5. A belt as set forth in claim 4 in which the convolutions are spot welded to each other at spaced points around the periphery of the belt.

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