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WIRE STRAPPING FOR PACKAGES WITH TWISTED TIE

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Fig. 1

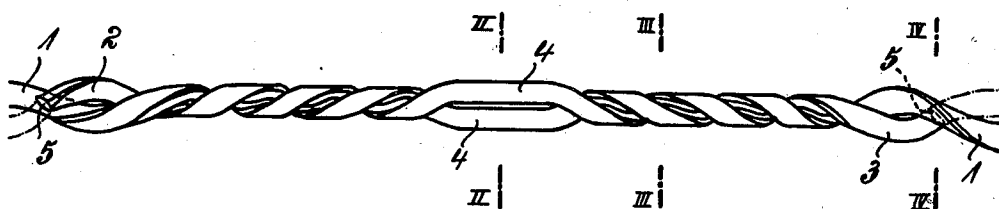


Fig. 2



Fig. 3



Fig. 4



Fig. 5

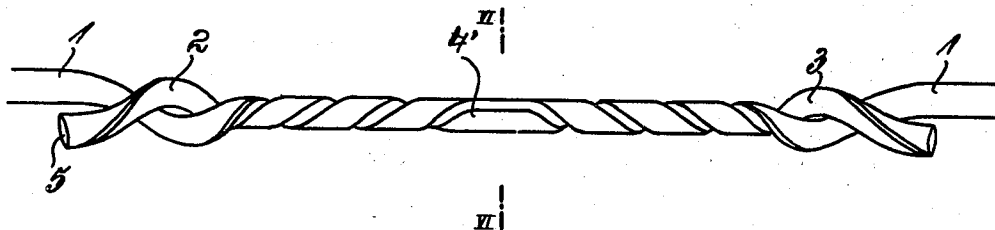
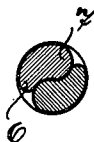


Fig. 6



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WIRE STRAPPING FOR PACKAGES WITH
TWISTED TIEOscar Kind, Rodenkirchen, near Cologne,
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8 Claims. (Cl. 24—27)

The wires used in the known wire strappings for boxes, bales and other packages having twisted ties show, at the twisting point, a resistance to breaking or disruption which, notwithstanding the doubling of the wires, is approximately 40% lower than the tensile strength of the single wire in the other parts of the strapping. For this reason it has hitherto been necessary to choose a thickness of the round wires considerably in excess of that actually needed if the tensile strength of the wire alone is considered. The disadvantage resulting herefrom is, apart from the relatively high consumption of wire, a diminished pliancy of the latter, thus rendering more difficult the operation of applying the wire strapping.

By means of the present invention it is possible to bring the resistance to tearing of the strap tie up to that of the wire material itself. This object is attained by employing for the production of the strapping, instead of the usual wires, wires having a flattened, preferably elliptically rounded cross-section, symmetrical about two axes at right angles to each other, the two wire ends being united at the twisting point in such a manner that in the screw turns the flat sides of the wires lie one upon another. This so increases the contact surfaces of the two wires lying one upon another, and evokes such a friction that the wires adhere to each other much more strongly, and despite a certain decrease in the strength of the single wires, which on account of the firm twisting is inevitable, a total tensile strength is obtained which at no point of the twisting section sinks below that of a single wire.

In addition to thus equalizing the resisting power of the twisted section and the tensile strength of the remaining part of the wire strap, which for a given breaking or disruption resistance of the strap, admits of a 40% decrease in the weight of wire for each strap as compared with the usual strapping wires with round cross-section, and at the same time facilitates the operation of making the tie by reducing the resistance, the bending resistance in itself is still further reduced to a great extent by the use of the flattened cross-section of the wire. An additional advantage of this flat cross-sectional form is that the wire lies more flatly upon the wood or other wrapping material of the package and thus does not cut so deeply into the material as a result of its circumferential tension as is frequently the case with round wires, especially at the edges of the boxes. It is thus possible in

many cases to effect an additional saving by the use of lighter packing material.

The twisted tie of the strapping can be carried out by means of the machines already being used for this purpose without any considerable alteration to the same being necessary, except that the width and breadth of the twisting slot and the holding clamps have to be adjusted to the dimensions of the wire. In the drawing Fig. 1 gives a top view of the twisted tie of a wire strap corresponding to the present invention. Figs. 2, 3 and 4 show cross-sections on the corresponding lines of Fig. 1. Fig. 5 shows a slight variation of the twisted tie viewed as in Fig. 1, Fig. 6 a cross-section on line VI—VI of Fig. 5.

The strapping wire 1 running out from both sides of the twisting point has, as will be seen from the sectional drawing in Figs. 2 and 4, a more or less elliptically rounded cross-section. Its two ends 2 and 3 which overlap at the tying point are, as is also usual with round wires, inter-twisted by the free ends of the strapping wire 1 being held flat and contiguously in a clamp, while in the middle at 4, between these gripped sections, they are inserted in the slot of a twisting pinion, still being held flat and contiguously. If during the twisting rotation of the pinion, the two wire ends are both wound round each other to form screw bodies of opposite hand, the flat sides of the two wires will lie compactly one upon the other. The unequal extension of the two upper edges of the wire section, which is bound to result from this operation, effects a certain change in the cross-sectional form of the single wires, in that they somewhat resemble the outline of a comma, the doubly bent inner profile lines of which cling closely to one another, while the outer surfaces more or less strongly resemble a circle.

The usual process of cutting off the free ends of the wire projecting beyond the twisted portion is most effectually performed at the cutting point 5, which lies within the last twist, so that the latter protrudes as little as possible, thus diminishing the risk of damage.

If the breadth of the slot of the twisting pinion is but little broader than the smallest thickness of the wire profile, the two sections of wire lying in the slot during the twisting process will, as the termination of the same, remain lying straight and untwisted beside each other. By suitably dimensioning the breadth of the slot, it is however, also possible, at the beginning or approximate completion of the twisting process, to extend this to the middle part 4 of the twist, so

that this section, as shown in Fig. 5, is twisted together to form screw turns running into one another. In this case, the strapping is given a twist which is almost cylindrical, except at the two ends situated near the gripped sections, at which points the twisting pitch runs steeply until the straight position of the strapping wire is reached.

Instead of the elliptical form, one can also give the flattened cross-section profiles of the wire other suitable forms which are symmetrical about two axes, or even an unsymmetrical form, for example, a form resembling a segment of a circle. In the latter case it is advisable to insert the ends of the wires in the twisting machine so as to cause the flatter profile sides of the wires to lie one upon another in the twists. A wire cross-section with a symmetrically flattened profile is, however, to be preferred, as it requires no special caution when inserting the wires in the twisting machine, because the wires, owing to their diminished bending resistance, always lie properly and flatly beside each other.

I claim:—

1. A wire strapping for boxes and other packages, having a twisted tie, the strapping wire being of laterally compressed form, characterized in that the cross-section profile is formed after the manner of an ellipse symmetrical about two axes standing one upon the other.

2. A metal tie comprising a wire-like strand having overlapping ends in contact with each other, the contacting surfaces thereof having sigmoidal surfaces, the overlapping portions of the wires being oppositely twisted from a location approximately centrally of the length of the overlapped portions.

3. A metal tie comprising a wire-like strand whose normal cross section is symmetrically shaped about two superimposed axes characterizing an ellipse, the material having its ends overlapping and having the helical twists extending

on both sides of a locking center and oppositely pitched with respect to the said center.

4. A metal tie comprising a wire-like strand having a cross-section sigmoidal on one side and arcuate on the other side, said strand having its ends overlapped to form a tie with their sigmoidal faces in engagement characterized in that one of the two arc shaped side faces of one section of the wire rests against one of the two arc shaped side faces of the overlapping section of the wire.

5. A metal tie comprising a wire-like strand having a cross-section sigmoidal on one side and arcuate on the other side, said strand having its ends overlapping ends with the sigmoidal shaped side of one portion of the wire resting against the sigmoidal shaped side faces of the other section of the wire, the said overlapping ends of the wire being helically twisted with oppositely directed pitch from a zone intermediate the overlapped portions.

6. A coupling for a wire strap comprising overlapped wire sections, each of which has a sigmoidal side face, the sigmoidal face of one wire section resting against the corresponding face of the other section, the said sections of wire being twisted together.

7. A coupling for a wire strap comprising overlapped wire sections, each of which has a sigmoidal side face, the sigmoidal face of one wire resting against the corresponding face of the other wire, the said sections of wire being helically twisted in opposite directions from a point between the ends of the twisted sections and the said twisted portions being oppositely pitched on the two sides of the said point.

8. A wire tie consisting of two lengths of wire twisted together, the cross section of the tie being substantially circular and the contacting surfaces of the wire lengths extending substantially from one point of the cross section to a diametrically opposite point thereof.

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