

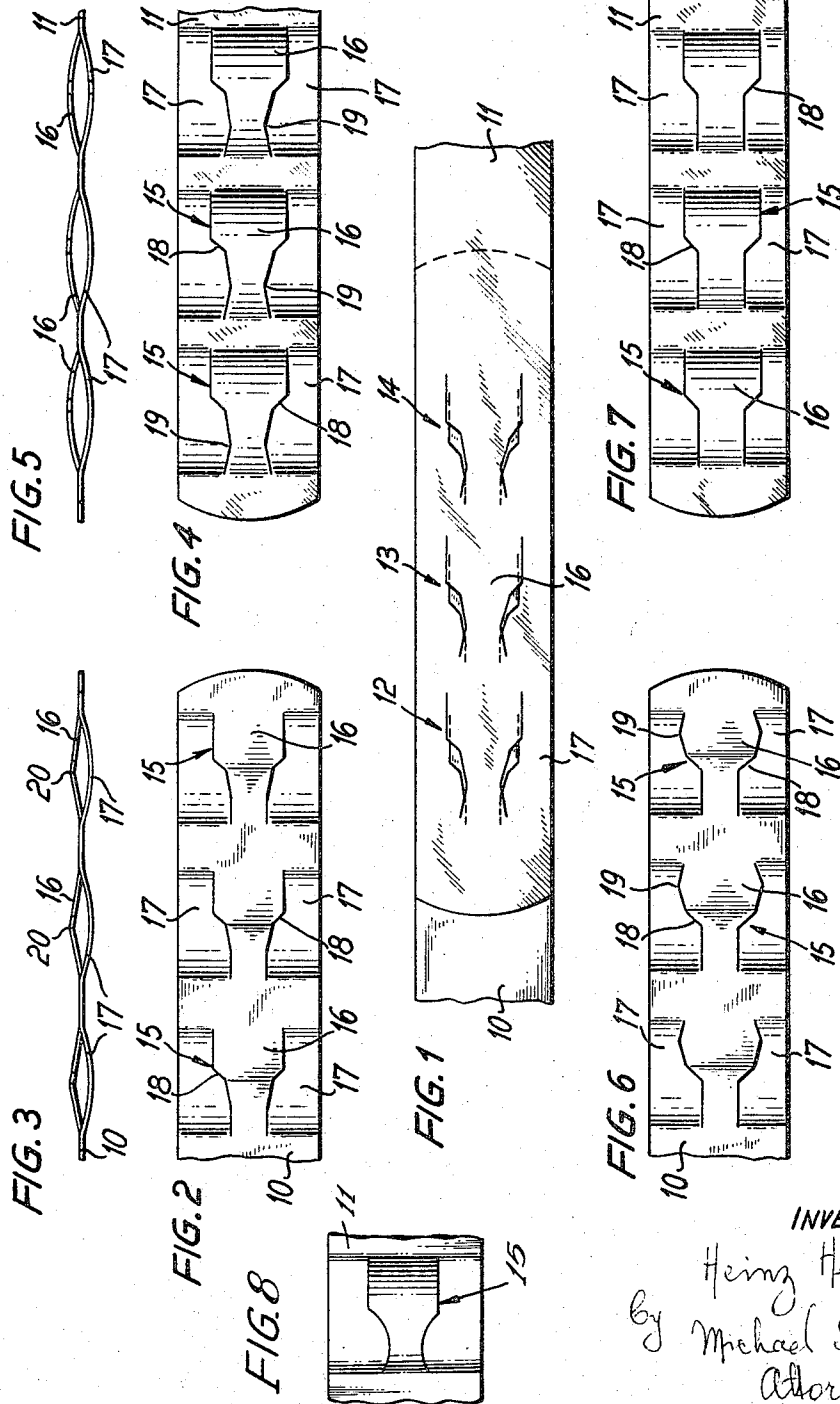
Sept. 17, 1968

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3,401,431

BALE TIES

Filed March 27, 1967



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1

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BALE TIES

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Filed Mar. 27, 1967, Ser. No. 626,011

Claims priority, application Germany, Mar. 31, 1966,

T 30,822

8 Claims. (Cl. 24—20)

ABSTRACT OF THE DISCLOSURE

Bale ties of the type having interengaging catches formed at opposite ends by bending out a web of material from between pairs of stepped incisions in each end of the tie in which the webs are so shaped so as to snap fit into the incisions in the other end of the tie.

This invention relates to bale ties of the type comprising a metal band in the opposite ends of which are formed catches which are adapted to interengage when the ends of the band are placed in overlapping relation, to hold the two ends of the band together.

The invention relates more particularly to the type of tie in which the catches in the opposite ends of the tie are formed by pairs of stepped incisions in the ends of the tie, the incisions in each pair being mirror images one of the other, and the central web formed between each pair of incisions being bent out of the plane of the tie.

In this type of tie, the incisions generally comprise two end portions lying generally parallel to the longitudinal axis of the tie but at different transverse locations on the tie and an intermediate portion lying obliquely to the axis of the strip and joining the adjacent ends of the two end portions.

Generally, but not always, the incisions are formed on opposite sides of the centre line of the strip so that the webs formed between the two incisions of each pair lie along the centre line of the strip.

The webs formed by each pair of incisions are bent out of the plane of the bale tie, successive webs being bent out on alternate sides of the tie.

Bale ties of this type are adapted to be fastened together by hand with the bent out webs in one end engaging behind the webs in the other end of the tie. Such ties are usually placed in position while the bale or other package is in a press. When the press is opened the bale expands and tensions the tie. Under this tension the overlapping ends of the tie are moved longitudinally relative to one another so that the angular incisions in one end of the tie engage in a hooked position in the angular incisions in the other end of the tie.

Although such bale ties have the benefit of being fastenable by hand, they have the disadvantage that they can become unfastened accidentally either before the tension is applied, or afterwards and when the tie is eventually severed.

Additional safeguards have been provided to prevent accidental release of the tie. For example, the overlapping webs may be compressed after fastening or additional catches can be formed after fastening to lock the overlapping ends firmly together. These additional safeguards however require special tools so that the ties can no longer be fastened simply by hand.

It is an object of the invention to provide a bale tie of the above type in which the danger of accidental release of the fastening is reduced yet the tie is still capable of being fastened simply by hand.

This is achieved according to the invention, by providing on the central webs of the first end of the tie at their

2

broader ends outwardly directed lateral projections wider than the greatest internal width between the incisions in the other end of the tie and/or providing the side webs lying between the incisions and the longitudinal edges of said other end of the tie at their broader ends with projections directed inwardly towards one another with the space between them less than the narrowest width between the incisions at the first end of the tie. In such an arrangement said projections snap into the incisions, which are splayed out by the curvature of the webs when transferred to the position of engagement. This is a simple method of ensuring that the projections for snapping into position can be formed in the band at the same time as the incisions. When the fasteners are brought into the position of engagement the projections snap into position, resiliently deforming the webs formed by the incisions, and thereby prevent the fasteners from being accidentally opened.

It is an advantage for the projections to be formed by angular portions of the incisions. This makes it particularly easy for the projections to be formed in the webs, since all that is required is to make the incisions angular at a given place.

Alternatively, the projections may be formed by arcuate portions of the incisions. In this case they are of course equally easy to apply, since the incisions simply have to be curved at the appropriate places. The arcuate construction further obviates the need for additional corners.

It is also advantageous for the central webs of the first end of the band to be provided with a transverse kink in the centre. This simplifies the interengagement of the fasteners, since the central sections of the angular incisions in the region of the kink project further out of the plane of the band and thus allow the fasteners to be inserted deeper into one another until the projections snap into place.

The movement of the fasteners into the hooked position can be further facilitated if the narrow ends of the central webs at the first end of the band, which co-operate with the said side webs—provided with projections—at the second end of the band, taper outwards substantially from halfway along their length towards the broader portion of the central webs. The projections, which in any case have oblique edges, therefore abut these tapered surfaces of the central webs when the fasteners are being engaged, so the said projections are helped to snap into position with resilient deformation of the webs formed by the incisions.

Two examples of the invention are illustrated in the accompanying drawings in which:

FIG. 1 is a plan view of a bale tie with fasteners according to the invention, partly broken away,

FIG. 2 is a plan view of the lower end of the tie, partly broken away,

FIG. 3 is a side elevation of the end of the tie shown in FIG. 2,

FIG. 4 is a plan view of the top end of the tie, partly broken away,

FIG. 5 is a side elevation of the end of the tie shown in FIG. 4,

FIG. 6 is a plan view of the lower end of the tie in a second embodiment, partly broken away and

FIG. 7 is a plan view of the top end of the same tie, also broken away and

FIG. 8 is a partial plan view of a modification of the lower end of the tie shown in FIG. 6.

For the sake of simplicity the drawings show only the two overlapping end portions 10 and 11 of a metal tie for tying bales or other packages. The two ends of the tie, the lower end portion 10 and the upper end portion

11, can be hooked into one another by hand by means of three sleeveless fasteners 12, 13, 14, located one behind the other longitudinally of the tie. The ends 10, 11 of the tie can naturally be provided with fewer or even more fasteners, although in practice it has been found particularly advantageous to use three. Each fastener 12, 13, 14 has angular incisions 15 arranged in pairs in mirror image to one another on each side of the longitudinal axis of the tie. The central webs 16 lying in between the incisions 15 and the side webs 17 lying between the incisions and the longitudinal edges of the tie are in known manner alternately pressed out of the plane of the tie in opposite directions. Owing to the zig zag or stepped shape of the incisions 15 the central webs 16 vary in width, each web 16 having a broader region at the right in the drawing and a narrower region at the left. The central webs 16 at both ends 10, 11 of the tie are uni directed, i.e. the broad and narrow ends of the said webs point in one and the same direction.

In order that the two ends 10, 11 of the tie can easily be hooked into one another by hand without using special equipment the fasteners 12, 13, 14 differ in construction, i.e. at the lower end 10 of the tie the central webs 16 are narrower than the internal spacing between the side webs 17 of the upper end 11. Expressing this the other way round, the gap between the side webs 17 is less than the narrowest width between the incisions in the lower end of the tie. This difference is exaggerated in the drawing and need in fact only amount to very few tenths of a millimetre. In this way the ends 10, 11 can be engaged by hand despite the ridge formed by stamping the incisions 15.

The packages are compressed before the ties are put round them and when the press is opened the fasteners 12, 13, 14 are kept in the hooked position by the expanding force of the packages; in this position the projecting corners formed by the angular incisions 15 and particularly the central sections 18 thereof engage one behind the other.

To prevent the fasteners 12, 13, 14 of the tie from opening accidentally, the pairs of side webs 17 at the second, upper end of the band 11 are provided at their broader ends with projections 19 directed inwardly towards one another (see particularly FIGS. 1 and 4). The spacing between projections 19 is narrower than the central web 16 of the first, lower end 10 of the tie and when the fasteners are brought into the engaged position are snapped into the angular incisions 15 which are splayed out by the curvature of the webs 16, 17. They need engage below the central webs 16 of the lower end 10 only by about one tenth of a millimetre. To bring out the fact of this bottom overlap the size of the projections 19 is exaggerated in the drawings. The above method provides a reliable way of preventing the fasteners 12, 13, 14 from being accidentally unhooked.

As illustrated particularly in FIGS. 6 and 7, outwardly directed lateral projections 19 may additionally or alternatively be provided at the broader ends of the central webs 16 of the first end 10 (adapted to be inserted between the side pairs of webs 17 at the second end 11 of the tie) and may be wider than the internal width between the pairs of webs 17. The projections 19 may of course be provided both at the broader ends of the pairs of webs 17 at the second end 11 and at the broader ends of the central webs 16 at the first end 10.

FIGS. 4 and 6 in particular show how the projections 19 are formed by angular sections of the incisions 15. They could naturally be formed by arcuate sections of the said incisions as for instance shown in FIG. 8. All that is required is that the projections 19 should have their maximum width substantially at the centre of the broad end sections of the webs 16 and/or 17 and should gradually taper towards the ends so that the said projections can snap into position when the fasteners 12, 13, 14 are engaged.

The interengagement of the fasteners 12, 13, 14 is

further facilitated by the fact that the central webs of the lower end 10 are provided with a transverse kink 20 in the centre. The central sections 18 of the incisions 15, in the region of the kink, thereby project further from the plane of the tie and thus enable the fasteners to be inserted deeper into one another until the projections 19 snap into position.

As shown particularly in FIG. 2, the narrow ends of the central webs 16 at the first end 10—co-operating with the lateral webs 17 at the second end 11, provided with projections 19—may broaden out in a wedge shape from approximately half way along their length towards the broader section of the webs 16. This makes it still easier to snap the projections 19 into place, since they are already formed by tapering incisions and when the fasteners 12, 13, 14 are engaged these projections will be applied to the wedge surfaces and snapped into position with resilient deformation of the webs 16, 17.

As already mentioned, the embodiments illustrated are only examples of the invention; the invention is not restricted to these and many other constructions and applications are possible. The projections could, for example, be designed not to snap into position until the ties are fully loaded.

I claim:

1. In a bale tie of the type having interengageable fastening catches at each end of the tie, said catches comprising pairs of stepped incisions formed in the region of each end of the tie and extending substantially in longitudinal direction of the latter, the incisions in each pair being mirror images of each other and comprising a pair of first end portions spaced farther from each other than a pair of second end portions and both extending substantially parallel to the longitudinal axis of the tie and a pair of intermediate portions extending obliquely to the axis and respectively joining adjacent ends of said end portions, the incisions in each pair defining between themselves central web means bent out of the plane of the tie and between the longitudinal edges of the tie and the incisions adjacent thereto side web means, the incisions in each pair on one end of the tie being spaced further from each other than those on the other end of the tie so that the central web means at said other end may be pushed through the space between the side web means on said one end when said ends of the tie are brought in overlapping relationship during engagement of said catches, the improvement wherein said pairs of incisions at least one end of the tie define on at least one of said web means a pair of opposite projections projecting toward the other of said web means and being spaced from each other such a distance so as to overlap one of said pair of end portions of each pair of incisions at the other end of the tie, said projections being arranged to snap into locking engagement with while resiliently deforming said other web means when the catches at the ends of said tie are brought into engagement to prevent accidental opening of the catches.

2. A bale tie as defined in claim 1, wherein said opposite projections extend outwardly from the broader portion of each central web means at the other end of said tie, and wherein the spacing between said projections is greater than the spacing between said pair of first end portions of the incisions on the one end of the tie.

3. A bale tie as defined in claim 2, and including opposite projections extending inwardly from said side web means on said one end of said tie and wherein the spacing between said projections is smaller than the spacing between said pairs of second end portions of said incisions on the other end of said tie.

4. A bale tie as defined in claim 1, wherein said opposite projections extend inwardly from said side web means on said one end of said tie and wherein the spacing between said projections is smaller than the spacing between said pairs of second end portions of said incisions on the other end of said tie.

5

5. A bale tie as defined in claim 1, wherein said projections are formed by angled portions of said incisions.

6. A bale tie as defined in claim 1, wherein said projections are formed by arcuate portions of said incisions.

7. A bale tie as defined in claim 1, wherein said central web means in said other end of said tie are provided with a central transversely extending kink.

8. A bale tie as defined in claim 1, wherein the narrow ends of said central web means in said other end of said tie are tapered from approximately halfway along their length toward the broader portion.

6

References Cited

UNITED STATES PATENTS

3,137,047 6/1964 Mosey ----- 24—20

FOREIGN PATENTS

1,092,982 11/1954 France.

908,235 4/1954 Germany.

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