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[33]		Germany
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[56]

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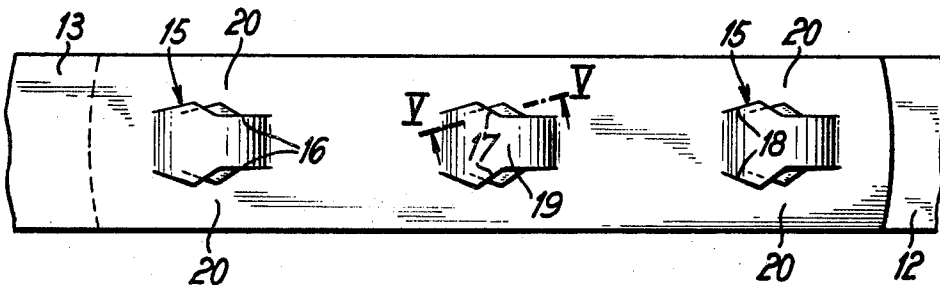
[54] STRAPPING STRIP
2 Claims, 6 Drawing Figs.

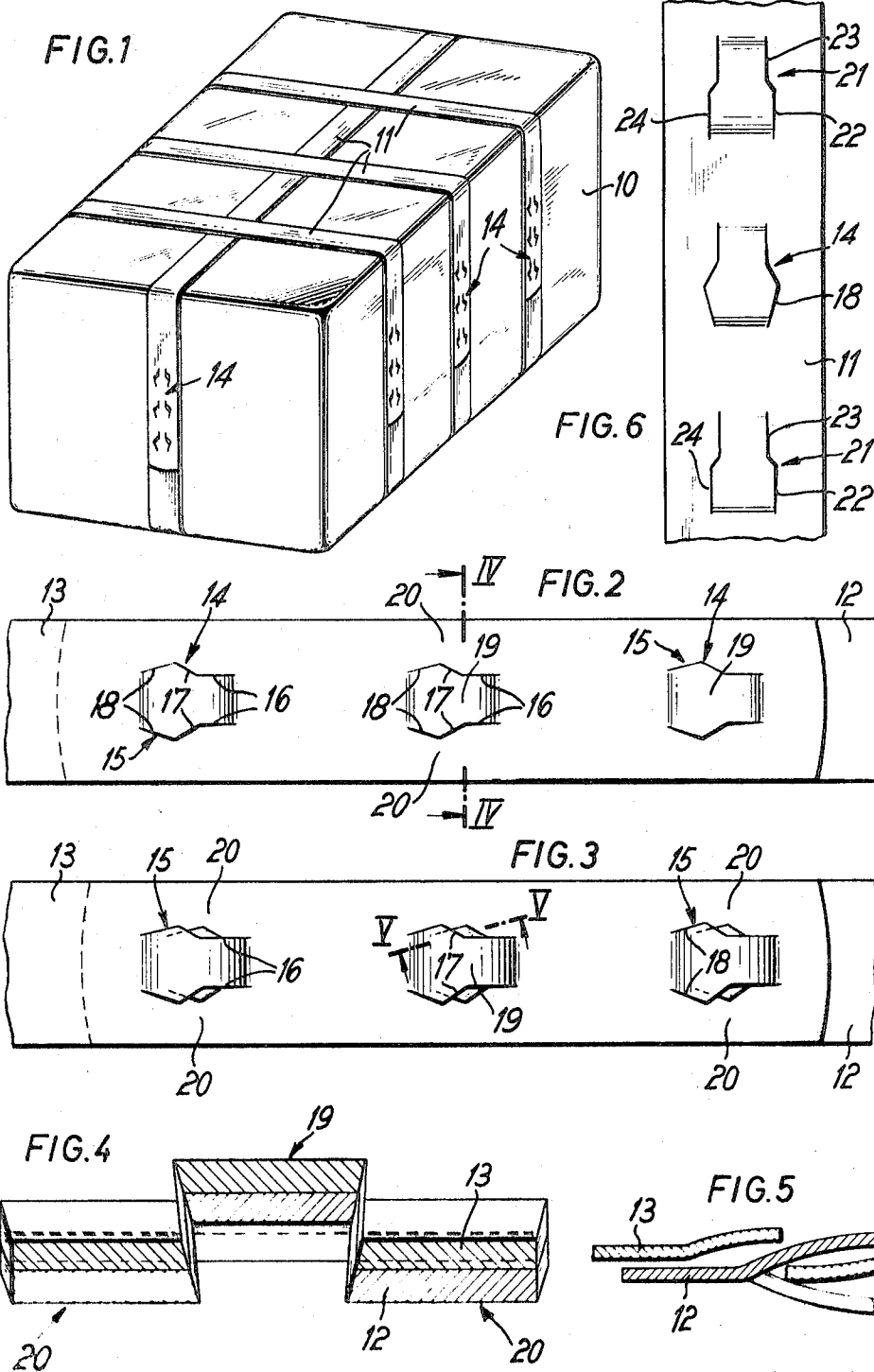
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24/20 (EE), 23 (EE)

ABSTRACT: A strapping band for packages and the like is provided at overlapping end portions with lock means formed by at least two fastening catches each comprising webs bent out of the plane of the band from between pairs of longitudinally extending stepped slots. At least one of the lock means is constructed in such a manner to check, after engagement, longitudinal movement of said end portions of the band in either direction.





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STRAPPING STRIP

The invention relates to a sleevelessly locking strapping strip for packages, which is arranged to overlap at the point of junction and is provided in this overlapping region with a plurality of lock means preferably formed by angle slots arranged in pairs, wherein the angle slots of each pair are arranged in mirror image to each other, are displaced relative to each other or arranged one behind the other, extend substantially in the longitudinal direction and have substantially a zigzag shape, wherein they have regions extending parallel to the longitudinal central line which then turn into central regions extending at an angle toward the outer edge of the strip which in turn terminate in end regions arranged at an angle thereto, while the webs formed by the slots are preferably pressed out of the plane of the strip alternately toward opposite sides and by bracing the strapping strip the lock means can be moved into a hooking position in which the angle slots and particularly the projecting corners formed by the central sections thereof, engage one behind the other. With this known sleevelessly locking strapping strip, when the angle slots forming the lock means have been brought into position the ends of the strip are moved in opposite directions in order to be able to move the lock means into their hooking position. However the ends of the strip can also be moved out of the engaged position in the opposite direction to the hooking position, so that the lock means come apart.

The invention is based on the problem of providing a sleevelessly locking strapping strip for packages of the above type, wherein the overlapping ends of the strip can be moved out of the engaged position of the lock means only toward the hooking position and wherein the lock means can accommodate high traction forces. This aim is substantially achieved according to the invention in that at least in one pair of slots the end region of each slot is directed back at an angle to the longitudinal center line and ends at a distance from the adjacent outer edge of the strip which is smaller than the distance between the outer edge of the strip and the region of the slot which extends parallel to the longitudinal center line. This provides in a simple manner that the cut faces formed by the end regions of the slots on the outwardly curved web of one end of the strip come into contact with the cut faces formed by the end regions of the slots on the outwardly curved web of the other end of the strip, and prevent the ends of the strip being moved in the opposite direction to the hooking direction. As the ends, formed by the end regions, of the slots of the underneath end of the strip cooperate with the central regions of the slots of the upper end of the strip, the lock means can be subjected to high loadings as the above hooking action takes place in addition to the hooking action of the central sections of the underneath end of the strip with the ends of the parallel regions of the slots of the upper end of the strip.

Therefore the carrying capacity of the lock means is not detrimentally affected by its particular construction and without additional means and by virtue of its construction alone the lock means prevents the ends of the strip being moved in opposition to the hooking direction, while the ends of the strip are prevented from being lifted out of the engaged position by the burr formed at the edges of the cut in the stamping operation. Therefore the ends of the strip cannot come apart.

The ends of the strip can also be prevented from lifting out of the engaged position by the fact that at least of the webs formed by the slots at one end of the strip the webs curved out of the plane of the strip toward the other end of the strip overlap at least in their central regions the webs of the second end of the strip which are curved out of the plane thereof toward the first end of the strip. This can be effected in a simple manner by pressing together the lateral pairs of webs. By this means the inside distance between the lateral webs is smaller in the center of the slots than the width of the central web so that when the central web of one end of the strip is pressed into position, it cannot pass out between the lateral webs of the other end of the strip.

Two embodiments of the invention are illustrated in the drawings, in which:

FIG. 1 shows a package with strapping strips;

FIG. 2 shows a plan view of the overlapping ends of a strapping strip with the sleeveless lock means according to the invention, in the position in which the lock means are brought into position;

FIG. 3 shows the overlapping ends of a strapping strip in the position in which the sleeveless lock means take up their hooking position;

FIG. 4 shows a section taken along the line IV-IV of FIG. 2;

FIG. 5 shows a section taken along the line V-V of FIG. 3; and

FIG. 6 shows a plan view of a second embodiment of the sleeveless lock means in a position corresponding to the position shown in FIG. 2.

The package illustrated in FIG. 1 is provided in the longitudinal direction with one strapping strip and in the transverse direction with three strapping strips 11 arranged at distances from each other. The ends 12, 13 of the strapping strips are joined together with lock means 14. As particularly shown in FIGS. 2 and 3, three lock means 14 are provided in each of the overlap regions of the ends 12, 13 of the strip. The lock means 14 are formed by angle slots 15 arranged in pairs in mirror image to each other and extending substantially in the longitudinal direction and having substantially a zigzag shape. The angle slots 15 have regions 16 extending parallel to the longitudinal centerline of the strip 11, which then turn into central regions 17 extending at an angle toward the outer edge of the strip 11, which in turn terminate in end regions 18 which are directed back at an angle to the longitudinal centerline. In this case the spacing between the end points of the two end regions 18 of each lock means 14 is greater than the spacing between the two parallel regions 16 of the angle slots 15.

The webs 19, 20 formed by the angle slots 15 are pressed out of the plane of the strip alternately toward opposite sides, while the central webs 19 of one end 12 of the strip are passed between the lateral pairs of webs 20 of the other end 13 of the strip and by bracing the strapping strip 11 the lock means 14 can be moved into a hooking position in which the angle slots 15 and particularly the projecting edges formed by the central sections 18 thereof, engage one behind the other.

The arrangement of the end regions 18 of the angle slots 15 which extend back at an angle to the longitudinal centerline, provides that the cut faces formed by the end regions of the slots on the outwardly pressed central web 19 of the underneath end 12 of the strip come into contact with the cut faces formed by the end regions 18 of the angle slots 15 on the side webs 20 of the upper end 13 of the strip and prevent the ends of the strip being moved in opposite directions, in opposition to the hooking direction. Therefore the lock means 14 can only be moved from the engaged position illustrated in FIG. 2 in the hooking direction. This means that when the tension in the strapping strip 11 decreases, the lock means can only be pressed back out of the hooking position as far as the engaged position.

As the distance between the end points of the end regions 18 is greater than the distance between the two parallel regions 16 of the angle slots 15, as FIG. 3 particularly shows, in the hooking position the end, formed by the end region 18, of the angle slot 15 of the underneath end 12 of the strip cooperates with the obliquely outwardly extending central region 17 of the upper end 13 of the strip, to provide an additional lock-hooking action. Therefore hooking is not only effected by the central regions 17 of the angle slots provided in the underneath end 12 of the strip, which lie against the ends of the parallel regions 16 of the upper end 13 of the strip.

In order to prevent that the lock means 14 formed by the angle slots 15 come out of engagement when being handled, particularly if the lock means take up the engaged position illustrated in FIG. 2, the inside distance between the outer pairs of webs 20 formed by the slots 15, is less than the width of the central webs 19, at least in the central region of the angle slots

15. The inside distance between the lateral webs 20 can be reduced by pressing the lateral webs 20 together. The reduction of the inside distance between the lateral web 20 causes the central webs 19 to be held between the lateral webs 20 so that the overlapping ends 12, 13 of the strip can also not be lifted from each other with the angle slots 15 in the engaged position shown in FIG. 2. However the ends of the strip can be moved in opposite directions toward the hooking position.

In the embodiment illustrated in FIG. 6, only the end regions 18 of the slots 15 of the central lock means 14 are arranged at an angle to the longitudinal centerline of the strip 11. The other two lock means 21 which are most loaded when a traction loading is applied to the lock means 14, 21, are provided with end regions 22 extending parallel to the longitudinal centerline of the strip 11. As the lock means 14 is prevented from moving out of the engaged position in the opposite direction to the hooking direction, the other two lock means 21 can also not move out of the engaged position in the opposite direction to the hooking direction. In the case of the lock means 21, the relative displacement between the regions 22 and 23 of each angle slot 24 is slight so that the lock means 21 are adapted to carry the higher loading.

As already mentioned, the embodiments illustrated are only given by way of example of the invention which is not restricted thereto. On the contrary many other embodiments and uses are also possible. Thus for example the lock means according to the invention could also be used as a flick lock. The angle slots forming the lock means can also be formed in the overlapping ends of the strip in pairs or for all three lock means together. In addition, instead of being in mirror image beside each other, the two angle slots of any lock means can be arranged in the strip one behind the other or staggered relative to each other.

I claim:

1. Sleevelessly locking strapping strip for packages, which is arranged to overlap at the point of junction and is provided in this overlapping region with a plurality of lock means formed by angle slots arranged in pairs, wherein the angle slots of each pair are arranged in mirror image to each other, are displaced relative to each other and are arranged one behind the other, extend substantially in the longitudinal direction and have substantially a zigzag shape, wherein they have regions extending parallel to the longitudinal centerline of the strip, which then turn into central regions extending at an angle toward the outer edge of the strip, which in turn terminate in end regions arranged at an angle thereto, while the webs formed by the slots are curved out of the plane of the strip alternately toward opposite sides and by bracing the strapping strip the plurality of lock means can be moved simultaneously into a hooking position in which the angle slots and particularly the projecting corners formed by the central sections thereof, engage one behind the other, characterized in that at least in one pair of slots the end region (18) of each angle slot (15) is directed back at an angle to the longitudinal centerline and ends at a distance from the adjacent outer edge of the strip (11), which is smaller than the distance between the outer edge of the strip (11), and the region (16) of the slot (15) which extends parallel to the longitudinal centerline.

2. A strapping strip according to claim 1, characterized in that at least in the webs formed by the slots at one end of the strip the webs curved out of the plane of the strip toward the other end of the strip overlap at least in their central regions the web of the second end of the strip which are curved out of the plane thereof toward the first end.

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