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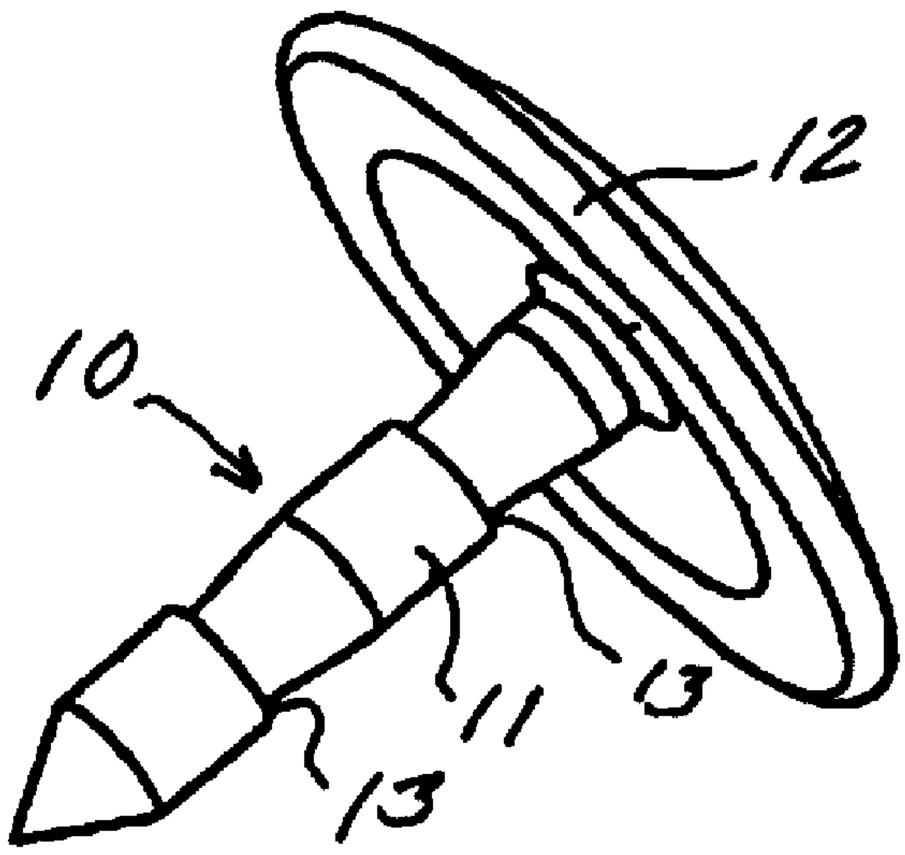
(54) **PROCEDE DE FIXATION D'EMBALLAGES A DES BALLES ET DISPOSITIF DE FIXATION UTILISE A CET EFFET**

(54) **A METHOD OF SECURING BALE WRAPPERS TO BALES AND A FASTENER FOR CARRYING OUT THE METHOD**



(57) Les emballages de balles, par exemple, de balles de pulpe, de balles de papier recyclé ou équivalent, sont fixés par des dispositifs de fixation par pression se présentant sous la forme de clous (10) introduits dans la balle en traversant l'emballage. Les clous (10) sont destinés à rester en permanence dans la balle avant de se dissoudre de la balle par digestion continue par la balle. Les clous de fixation (10) qui possèdent une tête (12) destinée à être en contact avec la surface extérieure de l'emballage, sont réalisés dans un matériau qui se dissout par digestion continue par la balle.

(57) The wrapping of bales, for instance pulp bales, recycled paper bales or the like, are secured by pressing fastener devices in the form of fastener pins (10) through the wrapper and into the bale. The pins (10) are intended to remain permanently in the bale prior to dissolving the bale in the continued bale treatment process. The fastener pins (10) will suitably include a head (12) for abutment with the outer surface of the wrapper, and are made of a material that will dissolve in the continued bale treatment process.

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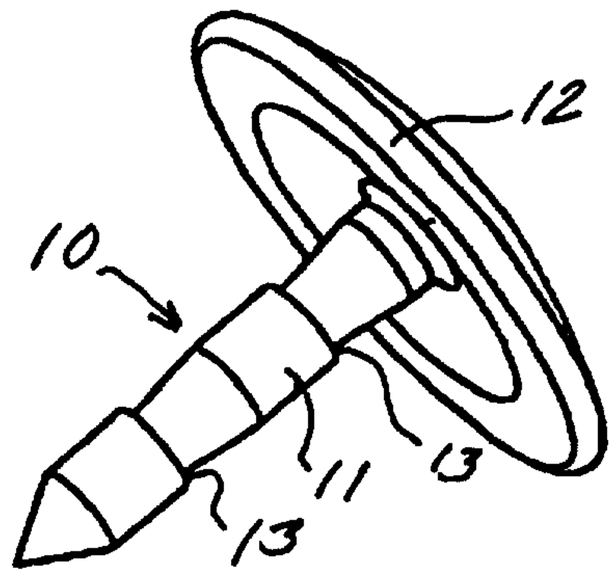
(54) Title: A METHOD OF SECURING BALE WRAPPERS TO BALES AND A FASTENER FOR CARRYING OUT THE METHOD

(57) Abstract

The wrapping of bales, for instance pulp bales, recycled paper bales or the like, are secured by pressing fastener devices in the form of fastener pins (10) through the wrapper and into the bale. The pins (10) are intended to remain permanently in the bale prior to dissolving the bale in the continued bale treatment process. The fastener pins (10) will suitably include a head (12) for abutment with the outer surface of the wrapper, and are made of a material that will dissolve in the continued bale treatment process.



A METHOD OF SECURING BALE WRAPPERS TO BALES AND A FASTENER FOR CARRYING OUT THE METHOD

The present invention relates to wrapped bales of the kind which in addition to containing paper pulp, recycled paper or like material also include a casing or wrapper around the bale. This wrapper must be secured in some way or another. Hitherto, the wrapper has normally been secured in place by a number of steel wires that are wrapped around each individual pulp bale. This method is expensive in practice and complicates the process of transporting the bales from a pulp mill to a paper mill, for instance. The actual cost of the steel wire represents a material cost that must be met by the pulp manufacturer. It is also necessary to remove the wrapping wires after the bales have arrived at the paper mill, prior to the bales being fed into a bale shredder. This requires the provision of separate wire cutting equipment and also requires separate handling of the wire scrap that remains.

Several different methods of resolving this problem have been proposed. For instance, US-A 3,792,563 proposes a solution in which the wrapper is secured to the pulp bales by means of a dissolvable glue applied between the mutually overlapping parts of the wrapper. One drawback with this solution, however, is that the glue constitutes a foreign constituent when entire bales are defibered in the paper mill and thereafter delivered to the paper machines as paper stock. Another drawback is that it takes a certain amount of time for the glue to bind, which can result in an unnecessary bottleneck in the packaging line of the pulp mill. Essentially, the same drawbacks are encountered with the

method described in WO 93/00210, in which dissolvable polyvinyl-alcohol tape is wound around the pulp bales. SE-C 503 215 teaches a tool for punching and folding-in flaps of overlapping parts of the wrapping sheets so as to fasten said sheets around the pulp bale. This method requires the use of a complicated device for achieving these joins. The device and method are so complex as to render their use commercially indefensible in practice.

The object of the present invention is to solve the aforesaid problems and to enable bale wrappings to be secured in a simple and in an environmentally-adapted manner. This object is achieved with a method having the characteristic features set forth in Claim 1, and with a fastener device that has the characteristic features set forth in remaining Claims.

The invention will now be described in more detail with reference to the accompanying drawing, in which

Fig. 1 illustrates in perspective a first embodiment of an inventive fastener device; and

Figs. 2-6 are perspective views of respective further embodiments of the inventive fastener device.

Fig. 1 illustrates a first embodiment of an inventive fastener device, said device having the form of a bale wrapping fastening pin. The fastening pin 10 includes a stem 11 and a head 12. The size of the head 12 will be sufficiently large to retain the wrapping by abutment with the outer surface of the wrapping. The stem 11 of the illustrated embodiment includes means which prevent

withdrawal of the pin, in the illustrated case shoulders 13 that face upwards towards the head 12. Alternatively, said means may have the form of hooks. The pin 10 is conveniently made of a material that can be dissolved during later treatment of the bale. For instance, the pin may be made of corn starch, or maize starch.

Figs. 2-6 illustrate other embodiments of the inventive fastener device. Fig. 2 shows a variant that has four stems 11 provided on a plate 14. Fig. 3 shows a variant that has a single stem 11 which forms a T-shaped device together with a hooked head 15. Fig. 4 shows a variant that has two stems 11 interconnected by a cross member 16. Fig. 5 shows a variant in the form of a pin that has a very small head 17. Finally, Fig. 6 shows a variant in which the head is replaced with a grooved section 18 at the outer end of the stem 11. It has been found that the necessary technical effect can also be achieved in the absence of an actual head on the pin.

According to the inventive method, subsequent to having folded the wrapping around the bale, the wrapping is secured in position by pressing the fastener pin 10 into the bale. This can be readily achieved with the aid of a conventional nailing gun, for instance. The fastener pins need not be removed prior to dissolving the bale. The corn starch from which the pins are made will dissolve at the same time as the bale and is unharmful to the process. The material from which the pin is made and the density of said material can be varied in relation to the ease with which the pins shall dissolve.

The method and fastener pins according to the invention afford important advantages in comparison with earlier known technology. The material from which the pins are made is thus environmentally friendly. The pins need not be removed, therewith obviating the need of equipment for removing and handling the fastener devices, as distinct from the case in the earlier method that uses steel wire. The equipment required for handling and inserting the fastener pins is both simple and inexpensive.

CLAIMS

1. A method of securing bale wrappings, **characterized** by pressing fastener pins (10) into the bale through the wrapping, said pins being intended to be left permanently in position prior to dissolving the bale in the continued bale treatment process.

2. A fastener device for fastening bale wrappings, **characterized** by a fastener pin (10) made of a material that will dissolve in the continued bale treatment process.

3. A fastener device according to Claim 2, **characterized** in that the fastener pin (10) includes a head (12, 13, 15 or 16) for abutment with the outer surface of the wrapping, and at least one stem (11) which is intended to be pressed into the bale.

4. A fastener device according to Claim 2 or 3, **characterized** in that the stem (11) of said pin includes means (13) which prevent removal of the pin, for instance outwardly facing shoulders or hooks.

5. A fastener device according to any one of Claims 2-4, **characterized** in that the pin (10) is made of corn starch.

Fig. 2

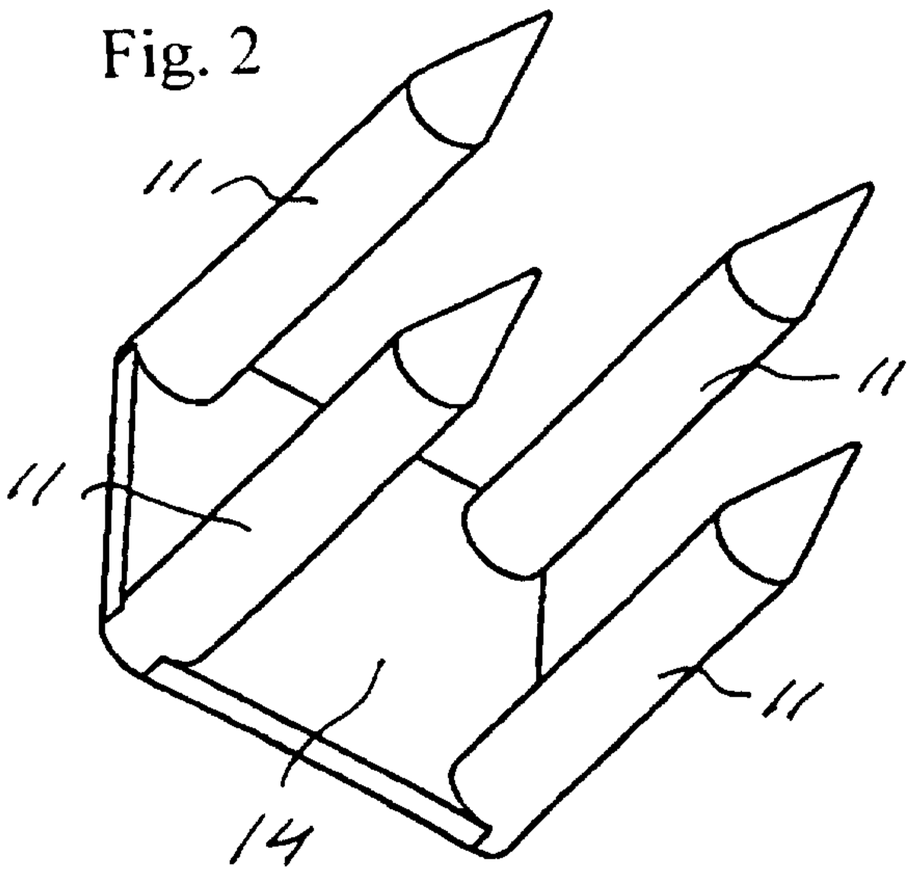


Fig. 1

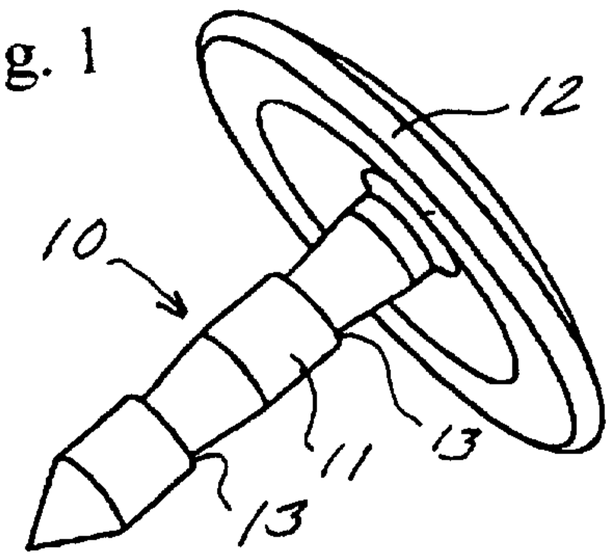


Fig. 3

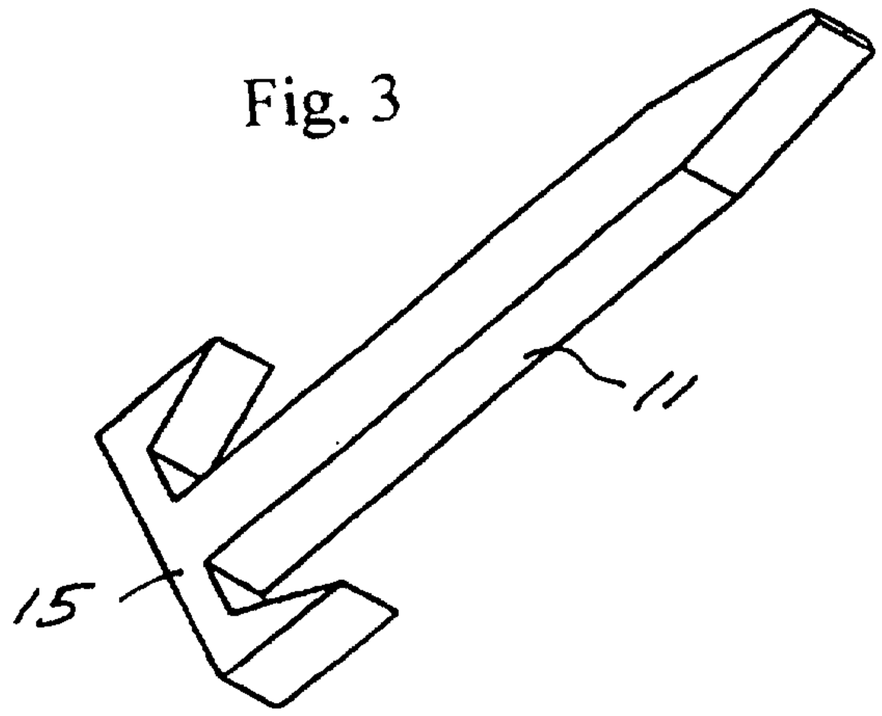


Fig. 4

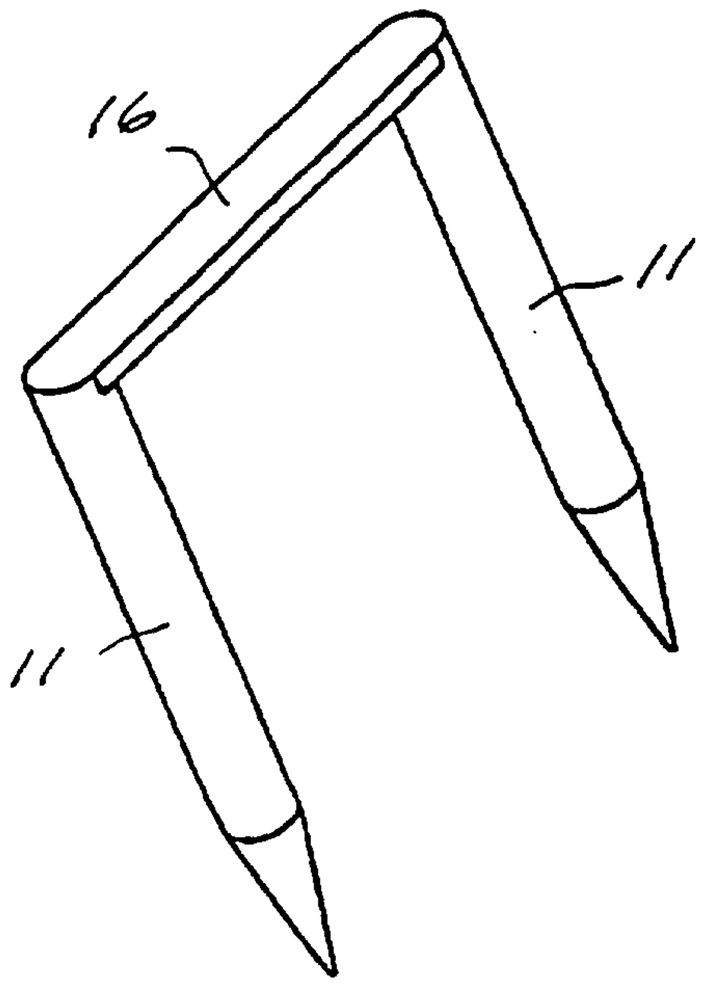


Fig. 5

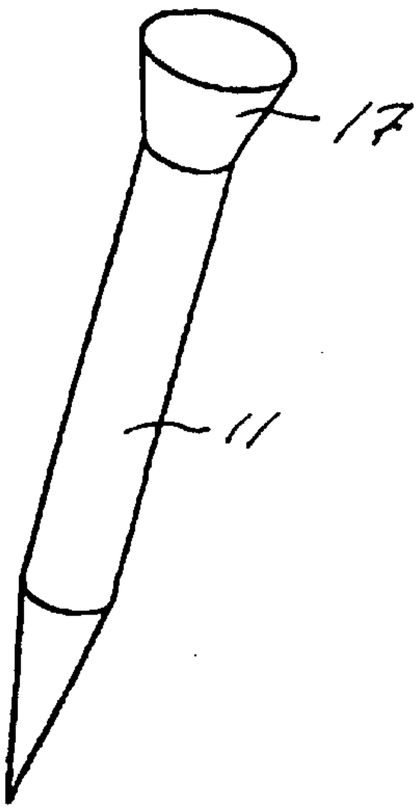


Fig. 6