REQUEST FOR A STANDARD PATENT
AND NOTICE OF ENTITLEMENT

The Applicant identified below requests the grant of a patent to the nominated person identified below for an invention described in the accompanying standard complete patent specification.

Applicant and Nominated Person:
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Invention Title:
DEVICE FOR STRAPPING COMPRESSIBLE PACKING GOODS SUCH AS LAYERS OF CORRUGATED CARDBOARDS

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Details of basic application(s):
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Applicant states the following:
1. The nominated person is the assignee of the actual inventor(s)
2. The nominated person is
   - the applicant
   - the assignee of the applicant
   - authorised to make this application by the applicant of the basic application.
3. The basic application(s) was/were the first made in a convention country in respect of the invention.

The nominated person is not an opponent or eligible person described in Section 33-36 of the Act.

11 May 1995
Signode Bernpak GmbH
By PHILLIPS ORMONDE & FITZPATRICK
Patent Attorneys
By

Our Ref: 409635
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DEVICE FOR STRAPPING COMpressible PACKING GOODS SUCH AS LAYERS OF CORRUGATED CARDBOARDS

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Claim

1. Device for strapping compressible packing goods such as layers of corrugated cardboard or the like, by means of a strap-shaped strapping material, such as a thermoplastic synthetic strap, from a strapping material stock, the device including at least one strapping material guide frame arranged in a substantially vertical plane; a press member for compressing the packing goods; a locking aggregate for the ends of the strapping material tightened around the packing goods; if required, a strapping material reservoir for holding a strapping material amount before the locking aggregate; a strapping material feeder and a strapping material supplying device between the strapping material stock and the locking aggregate or the strapping material reservoir, respectively, whereby the locking aggregate and, if required, the strapping material reservoir are arranged vertically movable with the press member, while the strapping material stock is arranged near the ground laterally outside the strapping zone and the press member; the strapping material supplying device including at least one channel-like strapping material transfer leading to the locking aggregate or strapping material reservoir, respectively, and the strapping material feeder being accessible from the outer side of the device where the strapping material stock is arranged, wherein the strapping material feeder is allocated to a lower section of a strapping material guide channel extending substantially vertically adjacent a post of the strapping...
frame, a strapping material deflection device for handing over the strapping material into the strapping material transfer is height-adjustably guided longitudinally of the strapping material guide synchronously with the press member and the strapping material guide channel is provided with a channel lock (lips), which opens automatically through the movement of the strapping material deflection device, at its side facing the strapping zone.
AUSTRALIA
Patents Act

COMPLETE SPECIFICATION
(ORIGINAL)

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Related Art:

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Invention Title:
DEVICE FOR STRAPPING COMPRESSIBLE PACKING GOODS SUCH AS LAYERS OF CORRUGATED CARDBOARDS

Our Ref : 409635
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The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

- 1 -
Device for strapping compressible packing goods such as layers of corrugated cardboards

The invention relates to a strapping device and more particularly to a device for strapping compressible packing goods such as layers of corrugated cardboard or the like.

Such devices, also called packing presses, have the task of strapping compressible packing goods on pallets or also without pallets to compact packing drums. In order to apply the high compression pressure of up to more than 5 t to the packing goods, the device features a vertically movable press plate. Thus the locking aggregate for the strapping material is movably coupled, i.e. it is also adjustable in height. Normally a strapping material reservoir is arranged before the locking aggregate, which holds a certain amount of strapping material, which thereby has not directly to be withdrawn from the strapping material feed drum. The strapping zone is located underneath the press plate and, therefore, also underneath the locking aggregate.

The packing goods are strapped by feeding and advancing the strapping material, which comes from the strapping material stock, from the locking aggregate into a section of an upper horizontal strapping material guide, such that it goes via a first strapping material deflection into a strapping material guide, which forms a post of the strapping material frame. From there the strap goes again via a strapping material deflection into a lower horizontally running strapping material guide, which, in the form of a tongue or "bayonet" goes underneath the palleted packing goods. At the end of the closed bayonet the strapping material then goes into a second post located opposite the first-mentioned post, and finally after passing a last strapping material deflection into the upper horizontal strapping material guide to the locking aggregate.

The front strapping material end is secured in a clamping device of the locking aggregate. Now the press plate moves down to the packing goods and compresses it. If the strapping material is now withdrawn in direction towards the
strapping material stock, the strapping material surrounding the packing goods in an annular form is peeled out of the strapping material guides and stretches over the packing goods. In the following the locking aggregate bonds the strapping material sections overlapping in its active area and separates the strapping material at the side leading to the strapping material stock. Thus the compressed packing goods are provided with a tight strapping.

If packing goods are within the strapping plane and the press plate with the locking aggregate, therefore, cannot be moved downwards, at least the locking aggregate allocated to the press plate (and also the optional strapping material reservoir) is situated in heights beyond the reach of the operator, which is due to the construction of such devices.

In order to facilitate the handling for supplying the strapping material to the locking aggregate when the press plate rests on the packing goods, either after changing the strapping material stock or after the strapping material was ripped or after another breakdown affecting the strap, a known device provides a strapping material transfer in the form of a tube-shaped channel, the channel port of which arranged laterally outside the strapping zone next to the strapping mouth forms a strapping material feeder into which strapping material can be manually fed and advanced to the locking aggregate, which then takes over the guiding end of the strapping material.

This auxiliary device spares the laborious handling of packing goods and manual machine controlling, for example, in order to remove the packing goods from the strapping zone, to lower the press plate, to provide the locking aggregate with new strapping material, to move the press plate up again and thereby bring the packing goods in strapping position, however, the manual supply of strapping material in a height above the head is very laborious and causes time-consuming operational interruptions.

It would therefore be desirable to provide a device as mentioned at the beginning for which operational interruptions are minimized due to required strapping material supply to the locking aggregate.

According to an aspect of the present invention, there is provided a device for strapping compressible packing goods such as layers of corrugated cardboard or the like, by means of a strap-shaped strapping material, such as a
thermoplastic synthetic strap, from a strapping material stock, the device including at least one strapping material guide frame arranged in a substantially vertical plane; a press member for compressing the packing goods; a locking aggregate for the ends of the strapping material tightened around the packing goods; if required, a strapping material reservoir for holding a strapping material amount before the locking aggregate; a strapping material feeder and a strapping material supplying device between the strapping material stock and the locking aggregate or the strapping material reservoir, respectively, whereby the locking aggregate and, if required, the strapping material reservoir are arranged vertically movable with the press member, while the strapping material stock is arranged near the ground laterally outside the strapping zone and the press member; the strapping material supplying device including at least one channel-like strapping material transfer leading to the locking aggregate or strapping material reservoir, respectively, and the strapping material feeder being accessible from the outer side of the device where the strapping material stock is arranged, wherein the strapping material feeder is allocated to a lower section of a strapping material guide channel extending substantially vertically adjacent a post of the strapping frame, a strapping material deflection device for handing over the strapping material into the strapping material transfer is height-adjustably guided longitudinally of the strapping material guide synchronously with the press member and the strapping material guide channel is provided with a channel lock (lips), which opens automatically through the movement of the strapping material deflection device, at its side facing the strapping zone.

Hence it is possible to supply a new strapping material front end to the locking aggregate in any operational position of the machine, i.e. also of the press plate and the locking aggregate. Moreover, there is the possibility to do this at least half-automatically by means of a strapping material injection device allocated to the strapping material feeder, which, like the strapping material stock, can be arranged near to the ground and, therefore, be easily accessible.

Moreover, the invention avoids a further disadvantage of the known device, namely that a free strapping material chord is permanently stretched between the strapping material stock and the port of the free end of the strapping material transfer, which is located at an alternatingly high level, whereby the
chord cannot only be damaged by inattentively carried loads, but the chord itself constitutes a source for injuries of people approaching it. Moreover, an additional strapping material stock needs to be installed within the area of the strapping material feed drum in order to accommodate the excess strap when the press plate is lowered.

Further features and advantages of the present invention will be apparent from the following description of a preferred embodiment of the invention with reference to and as illustrated in the accompanying drawings, in which:

Fig. 1 shows a view of the device with the strapping material introduced into the locking aggregate for the first time,

Fig. 2 shows a view corresponding to Fig. 1 with strapping material guided around the packing goods in the strapping frame,

Fig. 3 shows a corresponding view, now with strapping material tightened around the packing goods,

Fig. 4 shows a top view of the device during operation according to Fig. 1,

Fig. 5 shows a partial view of the strapping material supply,

Fig. 6 shows a section according to line VI-VI in Fig. 5, and

Fig. 7 shows a partial view in direction towards arrow VII in Fig. 1.

A device designated by 10 for strapping especially compressible packing goods 11 such as layers of corrugated cardboard or the like includes at first a strapping material stock 12 arranged near to the ground, with strapping material 14 rolled around a drum 13, especially thermally bondable plastic strap.

A transverse bar 16 is vertically movably arranged at posts 15, 15' in direction of the double arrow 17. The transverse bar 16 forms a press plate for compressing the packing goods 11, or is a part thereof, respectively, and has an aggregate 18 on its upper side serving the transport of the strapping material 14, which will be explained later on, and especially the formation of a strapping material lock, which is why the aggregate will be called a locking aggregate. A strapping material reservoir 19 is allocated to the locking aggregate 18, which, just like the locking aggregate 18, is driven and movably guided synchronously to the press plate 16 in uniform movements.
Strapping material guides 20 to 23 in form of straight channels or channel sections, respectively, of known construction are allocated to both posts 15, 15' and the transverse bar 16. It is moreover known to arrange the mouth-shaped formation of strapping material guide channels 20 to 23 to form a frame being closed in itself by bringing forward a lance or bayonet 24, equally containing a linear strapping material guide channel, undercutting the packing goods 11 or the pallet, on which it rests, at the bottom side in direction of arrow 42 of Fig. 1 into the position according to Fig. 2 or Fig. 3.

In order to be able to guide the strapping material 14 around the packing goods 11 it must first be supplied to the locking aggregate 18. For this reason a strapping material injection device 25 is provided near to the ground and directly behind the strapping material stock 13, which, by means of strapping material transport rollers 26 at least one of which is mechanically driven and the other is forcibly coupled with the former, bring forward the strapping material 14 into a strapping material guide 28 at the strapping material feeder designated by 27, whereby the strapping material guide 28 is arranged parallel and next to the post-like strapping material guide 21. Longitudinally to this strapping material guide 28 a strapping material deflection 29 is vertically movably arranged, which has the task of handing over the strapping material 14 to a horizontally arranged strapping material transfer 30 at the place where the strapping material deflection 29 is located, whereby the strapping material transfer 30 then brings it forward to the locking aggregate 18. In the embodiment this is carried out through the strapping material reservoir 19. As soon as the guiding free strapping material end contacts a switch 31 located in front of the locking aggregate 18 in the direction of the injection, the initial position for a first strapping of packing goods 11 is reached - see Fig. 1.

Vertically to the drawing level packing goods 11 to be strapped, with or without a pallet, is now transported into the strapping zone, for example, on a non-illustrated roller. The strapping material 14 is then brought forward by means of transport rollers 32, i.e. concerning Fig. 2 counter-clockwise through the strapping material guide 20, 21, 24, 22 and 23 as well as through the strapping material deflections 33 to 36 situated therebetween in the strapping material path,
until the front end of the strapping material 14 again enters the locking aggregate 18.

Already during this guidance of the strapping material, or immediately afterwards, the press plate 16, the locking aggregate 18 and the strap reservoir 19 move downwards on the upper side of the packing goods 11, which is now, depending on the quality and requirements, is correspondingly strong compressed.

In order to then tighten the strapping material 14 around the compressed packing goods 11 the actuation of the strapping material transport rollers 32 is reversed so that the latter withdraw the strapping material supplied from the strapping material stock 12 while the other strapping material end is secured at the locking aggregate 18 by a clamp. Due to the withdrawal of the strapping material the latter 14 is extracted from all strapping material guides inside, which, for this purpose are designed in the known manner, for example, are provided with flexible lips 39 as shown in Fig. 6 or with flaps opening in case of spring effects.

The produced excess amount of strapping material is transported back to the strapping material reservoir 19 and forms a stock to be used in the starting phase of the next strapping process. To make this feasible a controllable strap guiding corner 43 is allocated to the strapping material deflection designated by 40 within the strapping material reservoir 19 (for example by means of a lifting magnet 41 - Fig. 4).

At the first insertion of strapping material 14 and also after clearing a breakdown affecting the strapping material, strapping material 14 can be fed to the locking aggregate 18 from the ground in any position of the device 10. After removing possible strapping material rests from the machine the new strapping material front end is introduced into the injection device 25, which then charges the device 10 automatically with the strapping material 14 until it is passed on by the strapping material transport rollers 32 at or in the locking aggregate 18. It is essential that for this purpose, the additional strapping material guide 28 with the strapping material deflection 29 is provided according to the invention, which moves in vertical direction synchronously to the strapping material transfer 30 being allocated to the press plate 16 in uniform movements.
strapping material deflection 29 is provided according to the invention, which moves in vertical direction synchronously to the strapping material transfer 30 being allocated to the press plate 16 in uniform movements.

If the press plate 16 is lifted further packing goods or the same packing goods can be strapped once more in the described manner after having been advanced. In the last-mentioned case it is known to provide two strapping levels E1 and E2 (Fig. 4) parallel to each other, whereby the described strapping material guides and strapping material deflections are provided twice while the locking aggregate and, if required, a strapping material reservoir are provided only once. Therefore, the latter can be moved transversely to the two strapping levels E1 and E2, i.e. in or against the transport direction of the packing goods.

In this case the strapping material transfer 30 is adjustably provided corresponding to the aggregate displacement. In the embodiment it can swing around the joints designated by 37 and 38, whereby the joint 37 is stationarily provided in front of the strapping material deflection 29 and joint 38 is guided along by locking aggregate 18 or, as in the embodiment, by the strapping material reservoir 19. Consequently, it is not only unessential in which height the press plate 16 is provided, in case strapping material 14 has to be introduced anew, but also the respective transverse position of the locking aggregate 18 with regard to the strapping levels E1 and E2 can be any one.

The strapping material guide 28 according to the invention, which is provided at least for the semi-automatic injection of new strapping material 14 can be similar or identical to one of the strapping material guides 21, 22 and the strapping material deflection 29 can be similar or identical to one of the strapping material deflections 33, 36. As is shown in Fig. 7 the strapping material guide 28 is then merely upwardly offset as against those allocated to strapping levels E1 and E2, since the strapping material 14 is to fed above the press plate 16.
The claims defining the invention are as follows:

1. Device for strapping compressible packing goods such as layers of corrugated cardboard or the like, by means of a strap-shaped strapping material, such as a thermoplastic synthetic strap, from a strapping material stock, the device including at least one strapping material guide frame arranged in a substantially vertical plane; a press member for compressing the packing goods; a locking aggregate for the ends of the strapping material tightened around the packing goods; if required, a strapping material reservoir for holding a strapping material amount before the locking aggregate; a strapping material feeder and a strapping material supplying device between the strapping material stock and the locking aggregate or the strapping material reservoir, respectively, whereby the locking aggregate and, if required, the strapping material reservoir are arranged vertically movable with the press member, while the strapping material stock is arranged near the ground laterally outside the strapping zone and the press member; the strapping material supplying device including at least one channel-like strapping material transfer leading to the locking aggregate or strapping material reservoir, respectively, and the strapping material feeder being accessible from the outer side of the device where the strapping material stock is arranged, wherein the strapping material feeder is allocated to a lower section of a strapping material guide channel extending substantially vertically adjacent a post of the strapping frame, a strapping material deflection device for handing over the strapping material into the strapping material transfer is height-adjustably guided longitudinally of the strapping material guide synchronously with the press member and the strapping material guide channel is provided with a channel lock (lips), which opens automatically through the movement of the strapping material deflection device, at its side facing the strapping zone.

2. Device according to Claim 1, wherein a strapping material injection device is allocated to the strapping material feeder.

3. Device according to Claim 1 or Claim 2, wherein the strapping material guide channel corresponds to a post of the strapping frame, and the corner deflection
corresponds to that deflecting the strapping material from the strapping material
guide of the post in horizontal direction.

4. Device according to any one of Claims 1 to 3, wherein the strapping material
guide channel has the same length as a strapping material guide channel
appertaining to the post of the strapping frame, which, however, in contrast to this
strapping material guide channel is displaced upwardly.

5. Device according to any one of Claims 1 to 4, with at least two strapping
material guide channels provided in parallel vertical planes, between which the
locking aggregate and, if required, the strapping material reservoir can be
displaced, wherein the strapping material supplying device is arranged between
two posts of the strapping material guide channels and the strapping material
transfer is pivotably arranged between the strapping material deflection device
and the locking aggregate or the strapping material reservoir, respectively.

6. Device according to Claim 5, wherein the strapping material transfer is forcibly
pivotably coupled with the locking aggregate or the strapping material reservoir,
respectively.

7. Device according to any one of Claims 1 to 6, wherein the press member is a
plate.

8. Device for strapping compressible packing goods substantially as herein
described with reference to the accompanying drawings.

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Attorneys for:
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Abstract

With a device (10) for strapping especially compressed packing goods (11) by means of a strap-shaped strapping material (14) with at least one strapping material guide frame arranged in a vertical plane, a press plate (16) for compressing the packing goods, a locking aggregate (18) for the ends of the strapping material tightened around the packing goods, if required, a strapping material reservoir (19) before the locking aggregate, and a strapping material transfer (30) between a strapping material feeder (25, 26, 27) at the outside of the machine and the locking aggregate (18), the strapping material feeder (25, 26, 27) is allocated to a lower section of a strapping material guide channel (28) vertically extending next to a post (15, 15') of the strapping frame, longitudinally to the strapping material guide a strapping material deflection device (29) for handing over the strapping material (14) into the strapping material transfer (30) to the locking aggregate (18) is height-adjustably guided synchronously to the press plate (16) and the strapping material guide channel (28) is provided with a channel lock, which opens automatically through the movement of the strapping material deflection device (29), at its side facing the strapping zone. Thus a new strapping material front end can be fed to the locking aggregate (18) in any position, comfortable and near to the ground, easily also by means of automatic injection, whereby loss times during operation in connection with the strapping material can be considerably reduced.
FIG. 5