

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 775 654 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.05.1997 Bulletin 1997/22

(51) Int. Cl.⁶: **B65H 1/30**

(21) Application number: **96118177.3**

(22) Date of filing: **13.11.1996**

(84) Designated Contracting States:
DE FR GB

(30) Priority: **22.11.1995 IT GE950126**

(71) Applicant: **SASIB S.p.A.**
I-40128 Bologna (IT)

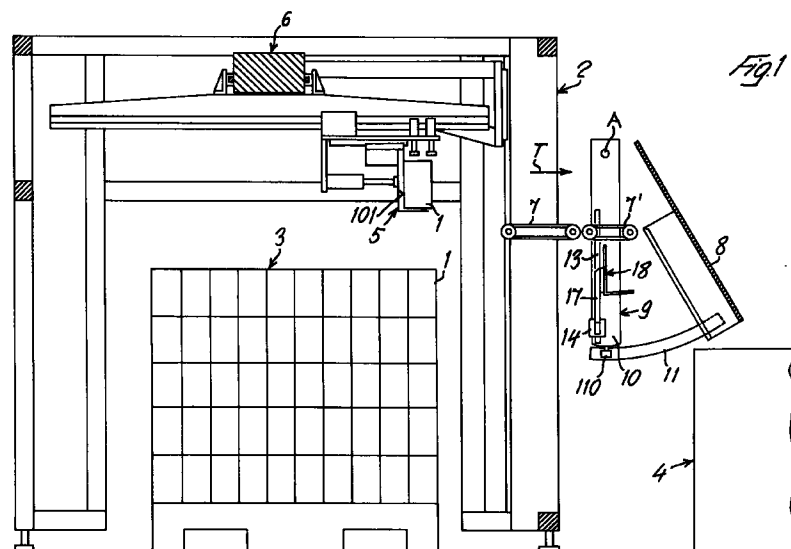
(72) Inventors:
• **Spada, Valter**
40043 Marzabotto (Bologna) (IT)
• **Martoccia, Nicola**
40127 Bologna (IT)

(74) Representative: **Porsia, Bruno**
c/o Succ. Ing. Fischetti & Weber
Via Caffaro 3/2
16124 Genova (IT)

(54) Device for feeding sheets, blanks and the like, especially in cigarette packaging machines

(57) A device for feeding sheets, blanks and the like, especially in cigarette packaging machines, comprises an input conveyor (7, 7') for inputting a succession of packs (1) and an unloading magazine (8) able to accommodate at least one pack (1), preferably two or more packs (1), of packaging sheets on top of each other and provided with an outlet end from which it is possible to take one packaging sheet at a time, and also intermediate transfer parts (9) between the input con-

veyor (7, 7') and the unloading magazine (8) which transfer individual packs (1) from said input conveyor (7, 7') to said unloading magazine (8). The input conveyor (7, 7') and the unloading magazine (8) are orientated relative to each other in such a way that the transfer parts execute a reciprocating angular movement in order to pass and transfer the packs (1) from said input conveyor (7, 7') to said unloading magazine (8).



EP 0 775 654 A1

Description

The invention relates to a device for feeding sheets, blanks and the like, especially in cigarette packaging machines.

The packaging sheets, more particularly the blanks for making cigarette packs, or the like are delivered to the feeders of the packaging machines in the form of a succession of packs of blanks. The separate packs are assembled in stacks made up of a number of layers of individual packs lying adjacent to each other along both their longitudinal and transverse sides. The feeders are therefore required to grasp the individual packs delivered by the collecting parts and feed them to the grasping means of the processing units of the packaging machines.

It is an object of the invention to provide a device for feeding packaging sheets, blanks and the like, especially in cigarette packaging machines, that offers a simple, reliable and fast means of grasping individual packs of packaging sheets and making them available to the processing machine, at the same time rendering the operations of collecting the packs from the stacks independent to some extent from the feeding of the packaging sheets to the processing machine.

The invention achieves the above objects with a feeding device of the kind described in the introduction, comprising an input conveyor for inputting a succession of packs and an unloading magazine able to accommodate at least one pack, preferably two or more packs, of packaging sheets on top of each other and provided with an outlet end from which it is possible to take one packaging sheet at a time, and also intermediate transfer parts between the input conveyor and the unloading magazine which transfer individual packs from said input conveyor to said unloading magazine.

The transfer parts transfer the packs from the input conveyor to the unloading magazine with a movement in the conveying direction, while the input conveyor and the unloading magazine are orientated relative to each other in such a way that the transfer parts execute a reciprocating angular movement in order to pass and transfer the packs from said input conveyor to said unloading magazine.

The unloading magazine preferably accommodates at least one pack, preferably two or more packs on top of each other, and is orientated in such a way that the axis perpendicular to the upper face of the packs accommodated inside it is inclined, its lower end diverging, in the conveying direction, away from the axis perpendicular to the upper face of the pack on the input conveyor, while the transfer parts carry each pack from the input conveyor to the mouth of the unloading magazine with an angular movement equal to the abovementioned angle of inclination.

The input conveyor and the unloading magazine include through openings for the transfer means, which execute a movement of collecting packs from the input conveyor and a movement of withdrawal out of the

unloading magazine, which movements are orientated transversely both to the direction in which the packs are conveyed on the input conveyor and to the direction in which the packaging sheets are unloaded from the unloading magazine, the input conveyor and unloading magazine contacting the individual packs in areas that do not coincide with the areas where the packs are contacted by the transfer parts, and said through openings for the transfer parts coinciding with said areas where the packs are contacted by the transfer parts.

Another feature is that the path followed by the transfer parts when collecting individual packs from the input conveyor intersects the transfer path, and the path followed by the transfer parts when withdrawing out of the unloading magazine intersects the path of the packaging sheets when being unloaded from it.

The transfer means execute an intermediate path segment that is orientated in the direction of unloading of the packaging sheets, by means of which the packs of packaging sheets are introduced into said unloading magazine.

In a preferred embodiment, the input conveyor consists of a pair of parallel conveyor belts or straps arranged at a distance from each other, which belts or straps are orientated with their conveying side horizontal, and upon which rest the end portions of the packs of packaging sheets, while the transfer parts consist of at least one carrying plate engaging with the free intermediate area of the underside of the packs of packaging sheets, between the areas resting on the conveyor means and which transfer parts can be raised and lowered transversely to the conveying direction, more particularly vertically, between a position below the conveying plane of the input conveyor and a position in which the pack is raised above the input conveyor.

The unloading magazine consists of an approximately vertical channel with a cross-section corresponding to that of the packaging sheets, while its wall nearest the transfer parts contains a continuous central opening wide enough for the carrying plate to pass through transversely with respect to the channel, and the transfer parts can be moved both in the longitudinal, that is axial, direction of the channel in both directions, and transversely with respect thereto.

The channel of the unloading magazine is preferably orientated so that its axis is inclined with respect to the axis perpendicular to the conveying plane, with its lower end diverging from said perpendicular axis in the conveying direction, the perpendicular axis and the unloading channel axis being situated in the same vertical plane orientated in the conveying direction, while the transfer parts are so supported that they can be raised and lowered transversely to the conveying direction and moved angularly back and forth through the angle of inclination between the axis perpendicular to the conveying direction and the unloading channel axis, between a position in which the raising and lowering path of the transfer parts is transverse, more particularly perpendicular, with respect to the conveying direction

and intersects the conveying path and a position in which the raising and lowering path is coaxial with the unloading channel.

A preferred form of construction has a guide for guiding the raising and lowering of the collecting parts between a position below the conveying plane of the input conveyor and a position in which the pack is raised above the conveying plane of the input conveyor, with which guide there are provided drive means for the rectilinear raising and lowering movement of the transfer parts, and which guide can be pivoted in both directions, together with the drive means for the raising and lowering movement of the transfer parts, in the vertical plane parallel to the axis perpendicular to the conveying plane of the input conveyor and the axis of the unloading channel, the pivot axis coinciding with the line of intersection between the transverse plane perpendicular to the conveying direction, i.e. the plane containing that side of the packs of packaging sheets on the input conveyor which is transverse and rearmost with reference to the conveying direction, and the plane containing said transverse rearmost side of the packs of packaging sheets in the unloading channel.

The top end of the unloading channel is advantageously situated at a radial distance from the pivot axis of the transfer means which is approximately the same as the distance of the conveying plane, so that when the pack is in the raised position, the transfer parts bring the pack to a position coinciding with the unloading channel simply by means of the angular movement, without having to raise it any further.

The rectilinear lowering movement of the transfer parts can extend down to approximately the bottom outlet end of the unloading channel.

The transfer parts consist of an L-shaped plate, one of whose arms forms the carrying plate that comes into contact with the underside of the pack and the other of whose arms forms a rear wall to retain the pack, against which the transverse rear side of the pack rests, especially during the pivoting transfer.

The L-shaped plate is slightly narrower than the distance between the two belts or straps that form the input conveyor and slightly narrower than the continuous longitudinal opening in the rear wall of the unloading channel.

Because of the fact that, when the pack is being collected from the input conveyor, the pack must be stationary alongside the transfer parts, the input conveyor may advantageously be made up of two independent conveyors arranged one after the other, of which the upstream one cooperates with the means used to collect packs from the stack of packs, while the one following it cooperates with the parts used to transfer the packs to the unloading channel.

The invention also encompasses other features which further enhance the device described above. These are the subject of the subordinate claims.

The special features of the invention and the advantages procured thereby will become clearer in the

description of a preferred embodiment, illustrated by way of a non-limiting example in the accompanying figures in which:

Fig. 1 shows a side elevation of the device according to the invention mounted between a cigarette packaging machine and a magazine that collects individual packs of packaging sheets from a stack of packs of packaging sheets standing on a pallet.

Fig. 2 shows an enlarged side view of the feed device shown in Fig. 1.

Fig. 3 shows a view from above, enlarged and partly sectioned, of the device of the previous figures.

Fig. 4 shows an enlarged view of the rear side of the transfer means and of the unloading magazine of the device shown in the previous figures.

With reference to the figures, a device for feeding packs 1 of packaging sheets, more particularly packs of blanks, such as blanks for making into cigarette packs, or the like, is interposed between a device 2 known as a depalletizer that collects individual packs from a stack 3 of packs, and a processing machine 4, in particular a cigarette packaging machine.

The depalletizer 2 comprises collecting parts 5 that are able to move 6 in such a way as to collect one by one all packs of packaging sheets 1 from the stack 3.

The feed device according to the invention comprises an input conveyor 7, 7' made up of a pair of continuous input belts or straps which are parallel and coplanar with each other and arranged a certain distance from each other and which define a horizontal conveying plane, on which the packs 1 rest, having at least their rear side 101 orientated vertically and transversely to the conveying direction T.

The input conveyor advantageously consists of two conveyors 7, 7' built approximately the same as each other and driven independently. These conveyors are arranged in line with each other in the conveying direction, one behind the other.

Immediately downstream of the second conveyor 7', with reference to the conveying direction T, is a magazine 8 for accommodating at least one, preferably two or more packs 1 standing on top of each other. The unloading magazine 8 consists of a channel with a cross-section corresponding to that of the shape in plan view of the packs 1 and aligned laterally with the packs 1 on the input conveyor 7, 7': in other words its central axis is contained in the same central vertical plane orientated in the direction T in which the packs 1 are conveyed on the input conveyor 7, 7', which central axis is inclined relative to the central vertical axis of the packs 1 on the input conveyor 7, 7' with its lower end diverging away from said vertical axis in the conveying direction T.

Provided with the input conveyor 7' and with the unloading magazine 8 are transfer means for transferring the individual packs 1 from the former to the latter.

The transfer means 9 consist of an arm 10 able to

pivot in the vertical plane orientated in the conveying direction T between a position of alignment with the vertical axis at the conveying plane and a position of alignment with the axis of the unloading channel 8.

The arm 10 is supported at its top end in such a way that it can be rotated about an axis coinciding approximately with the line of intersection between the plane containing the rear side 101 of the pack 1 in its position of transfer on the input conveyor 7' and the plane containing the rear side 101 of the pack 1 in the unloading channel 8, i.e. the plane generally containing the inside surface of the rear wall of the channel 8, with reference to the conveying direction T.

The pivot axis A is located higher than the conveying plane and than the top face of the packs 1 on the input conveyor 7'.

The top end of the unloading channel 8 is situated at a radial distance from the pivot axis A which is not less than the distance of the conveying plane of the input conveyor 7', and which in this example is approximately equal to the latter.

The bottom end of the pivoting arm 10 is engaged in a guide 11 which is constructed in the form of an arc of a circle. In particular, the guide 11 includes a groove 111 between whose side walls is engaged a roller 110 attached rotatably to an extension on the lower end of the arm 10 coaxial with the central axis of the latter.

The arm 10 is secured by one end to the free front end of a shaft 12 in such a way as to be coupled to it in rotation. The shaft 12 is driven in both directions of rotation by a motor M or by a drive taking the drive motion from other motors and converting it into the required reciprocating pivoting motion.

Fixed to the oscillating arm 10 is a longitudinal guide 13 orientated parallel to the longitudinal axis of the arm 10 and supporting a sliding block 14. The sliding block 14 is coupled to means 15 by which it can be driven up and down. These means may be of any type and in the example illustrated, in particular in Fig. 2, they consist of a screw-and-nut drive, with a separate motor 16 being provided to power said drive means. The drive means 15 and the motor 16 are supported, like the guide 13, on the pivoting arm 10.

The sliding block 14 carries, cantilever-fashion 17 in a position coinciding with the unoccupied area between the belts or straps of the input conveyor 7' and with the pack 1 standing on the latter, a plate 18 designed to support this pack. This plate 18 is bent into an L shape and its dimensions are such that it can pass between the two parallel belts or straps of the conveyor 7'. In addition, the bracket 17 supporting the L-shaped plate 18 comprises a horizontal arm orientated transversely with respect to the conveying direction T: it terminates in about the middle of the area between the two belts of the input conveyor 7' and itself comprises a vertical terminal arm surmounted at the top end by the L-shaped plate 18. The vertical arm of the bracket 17 is of a length such that the L-shaped plate 18 projects above the conveying plane of the input conveyor 7' while the horizontal

arm lies underneath said conveyor 7', the lowering movement of the sliding block 14 being such that in its bottommost position, the entire L-shaped plate 18 lies below the input conveyor 7' at approximately the level of the unloading bottom end of the unloading magazine 8.

The plate 18 is seat-shaped and comprises an approximately horizontal arm 118 designed to support the underside of the pack 1 and a rear arm 218 (referring to the conveying direction T) against which the rear side of the pack 1 is designed to rest.

The vertical arm 218 advantageously includes at its free top end a lip 318 inclined slightly backwards as a guide means. Moreover the arm 118 on which the pack 1 rests is not exactly perpendicular to the vertical arm 218 but inclined in order to provide an angle of slightly less than 90° with the rear arm 218.

When a pack 1 passes from the first input conveyor 7 to the second input conveyor 7', it is stopped in a position coinciding with the plate 18. The arm 10 is aligned, in a vertical position, with the pack 1. In the rest position the plate 18 is held underneath the input conveyor 7' in a position of non-interference. It is then raised and, as it passes between the two belts or straps of the conveyor 7', it lifts the pack 1 off the latter. In the next step the pivoting arm 10, with the L-shaped plate 18, is swung forwards, with reference to the conveying direction T, and the pack 1 is brought to a position coinciding with the accommodating space of the unloading channel 8 (see Fig. 2, position illustrated in chain lines). In this position the pack, and hence the L-shaped plate 18, are lowered coaxially relative to the unloading channel 8, until the pack 1 is at the bottom of the channel 8 if the channel is empty, or as far as the top face of the stack of packaging sheets formed inside the channel 8 by packs previously placed inside it. The mouth at the top of the unloading channel 8 is slightly flared, presenting inclined guide surfaces 108. The front wall of the channel 8, with reference to the conveying direction T, is advantageously also continued at the upper end beyond the end mouth of the channel 8.

The supporting bracket 17 of the L-shaped plate 18 passes into the interior of the channel 8 through a continuous longitudinal opening 208 which runs from the top end to the bottom end of the unloading channel 8 in the rear wall 308. This aperture 208 is wide enough to allow the L-shaped supporting plate 18 to pass through it, that is to say it is broader than the latter. The L-shaped supporting plate 18 can therefore be withdrawn from the unloading channel 8 simply by means of a rearward angular movement of the pivoting arm 10, carrying it to the vertical starting position aligned with and perpendicular to the conveying plane of the input conveyor 7', where the L-shaped plate 18 is underneath the input conveyor 7', in a position of non-interference with the pack 1 standing on the latter and is aligned vertically with said pack 1 standing on the input conveyor 7'.

The advantages of the present invention will be clear from the above account. The feeder of packs of packaging sheets to the processing machine 4 renders

the depalletizer 2 to some extent independent of that processing machine 4, at the same time allowing a certain number of packaging sheets to be accumulated in the unloading magazine, in order to make it possible to operate with some degree of autonomy between the two units.

The packs of packaging sheets 1 that arrive in succession on the palletizer are fed carefully to the unloading magazine 8 in a limited number of steps and along an extremely short transfer path. During transfer the packs 1 are constantly guided and supported in order to avoid mispositioning which could cause malfunctions. In particular, the packs 1 are guided and supported even during their insertion into the unloading magazine 8, so even here the problems of mispositioning of the packaging sheets in the pack, which can result in jamming, are eliminated. The pack 1 is carried as far as the upper filling level of the unloading magazine 8 and whatever free-fall drop may occur is essentially limited to the thickness of the supporting plate 18, or rather of the arm 118 of the latter, during its withdrawal. Even this operation is a relatively careful step and one that avoids damaging the packaging sheets or pulling them into incorrect positions. The combination of the raising and lowering paths with backward and forward angular movements makes it possible to provide a feed and return path for the transfer means which follows a closed loop and is always executed in the same direction, thus greatly simplifying the construction and the handling operations.

The invention is not of course limited to the practical embodiments described and illustrated, but can be greatly modified, especially from the constructional point of view, without departing from the underlying principle described above and claimed below.

Claims

1. Device for feeding sheets, blanks and the like, especially in cigarette packaging machines, characterized in that it comprises an input conveyor (7, 7') for inputting a succession of packs (1) and an unloading magazine (8) able to accommodate at least one pack (1), preferably two or more packs (1), of packaging sheets on top of each other and provided with an outlet end from which it is possible to take one packaging sheet at a time, and also intermediate transfer parts (9) between the input conveyor (7, 7') and the unloading magazine (8) which transfer individual packs (1) from said input conveyor (7, 7') to said unloading magazine (8).
2. Device according to Claim 1, characterized in that the transfer parts (9) transfer the packs (1) from the input conveyor (7, 7') to the unloading magazine (8) with a movement in the conveying direction (T), while the input conveyor (7, 7') and the unloading magazine (8) are orientated relative to each other in such a way that the transfer parts (9) execute a reciprocating angular movement in order to pass and transfer the packs (1) from said input conveyor (7, 7') to said unloading magazine (8).
3. Device according to Claim 1 or 2, characterized in that the unloading magazine (8) accommodates at least one pack (1), preferably two or more packs (1) on top of each other, and is orientated in such a way that the axis perpendicular to the upper face of the packs (1) accommodated inside it is inclined, its lower end diverging, in the conveying direction (T), away from the axis perpendicular to the upper face of the pack (1) on the input conveyor (7, 7'), while the transfer parts (9) carry each pack (1) from the input conveyor (7, 7') to the mouth of the unloading magazine (8) with an angular movement equal to the abovementioned angle of inclination.
4. Device according to one or more of the previous claims, characterized in that the input conveyor (7, 7') and the unloading magazine (8) include through openings (208) for the transfer means (9), which execute a movement of collecting packs (1) from the input conveyor (7, 7') and a movement of withdrawal out of the unloading magazine (8), which movements are orientated transversely both to the direction (T) in which the packs (1) are conveyed on the input conveyor (7, 7') and to the direction in which the packaging sheets are unloaded from the unloading magazine (8), the input conveyor (7, 7') and unloading magazine (8) contacting the individual packs (1) in areas that do not coincide with the areas where the packs (1) are contacted by the transfer parts (9, 18), and said through openings (208) for the transfer parts (9, 18) coinciding with said areas where the packs (1) are contacted by the transfer parts (9, 18).
5. Device according to one or more of the previous claims, characterized in that the path followed by the transfer parts (9) when collecting individual packs (1) from the input conveyor (7, 7') intersects the transfer path, and the path followed by the transfer parts (9, 18) when withdrawing out of the unloading magazine (8) intersects the path of the packaging sheets when being unloaded from it.
6. Device according to one or more of the previous claims, characterized in that the transfer means (18) execute an intermediate path segment that is orientated in the direction of unloading of the packaging sheets, by means of which the packs (1) of packaging sheets are introduced into said unloading magazine (8).
7. Device according to one or more of the previous claims, characterized in that the input conveyor (7, 7') consists of a pair of parallel conveyor belts or straps arranged at a distance from each other,

which belts or straps are orientated with their conveying side horizontal, and upon which rest the end portions of the packs (1) of packaging sheets, while the transfer parts consist of at least one carrying plate (18) engaging with the free intermediate area of the underside of the packs (1) of packaging sheets, between the areas resting on the conveyor means (7, 7') and which transfer parts (18) can be raised and lowered transversely to the conveying direction, more particularly vertically, between a position below the conveying plane of the input conveyor (7, 7') and a position in which the pack (1) is raised above the input conveyor (7, 7').

8. Device according to one or more of the previous claims, characterized in that the unloading magazine (8) consists of an approximately vertical channel with a cross-section corresponding to that of the packaging sheets, while its wall (308) nearest the transfer parts (9, 18) contains a continuous central opening (208) wide enough for the carrying plate (18) to pass through transversely with respect to the channel (8), and the transfer parts (18) can be moved (13, 14, 15, 16, 17) both in the longitudinal, that is axial, direction of the channel (8) in both directions, and transversely (10, 11, 12, M) with respect thereto.

9. Device according to one or more of the previous claims, characterized in that the channel (8) of the unloading magazine is orientated so that its axis is inclined with respect to the axis perpendicular to the conveying plane, with its lower end diverging from said perpendicular axis in the conveying direction, the perpendicular axis and the unloading channel (8) axis being situated in the same vertical plane orientated in the conveying direction (T), while the transfer parts (18) are so supported that they can be raised and lowered transversely to the conveying direction (T) and moved angularly back and forth through the angle of inclination between the axis perpendicular to the conveying direction (T) and the unloading channel (8) axis, between a position in which the raising and lowering path of the transfer parts (18) is transverse, more particularly perpendicular, with respect to the conveying direction (T) and intersects the conveying path (T) and a position in which the raising and lowering path is coaxial with the unloading channel (8).

10. Device according to one or more of the previous claims, characterized in that the transfer parts (9) comprise a guide (13) for guiding the raising and lowering of a carrying plate (18) between a position below the conveying plane of the input conveyor (7, 7') and a position in which the pack (1) is raised above the conveying plane of the input conveyor (7, 7'), with which guide (13) there are provided drive means (15) for the rectilinear raising and lowering

movement of the carrying plate (18), and which guide (13) can be pivoted in both directions, together with the drive means (15, 16) for the raising and lowering movement of the carrying plate (18), in the vertical plane parallel to the axis perpendicular to the conveying plane of the input conveyor (7, 7') and the axis of the unloading channel (8), the pivot axis coinciding with the line of intersection between the transverse plane perpendicular to the conveying direction (T), i.e. the plane containing that side (101) of the packs (1) of packaging sheets on the input conveyor (7, 7') which is transverse and rearmost with reference to the conveying direction (T), and the plane containing said transverse rearmost side (101) of the packs (1) of packaging sheets in the unloading channel (8).

11. Device according to one or more of the previous claims, characterized in that the top end of the unloading channel (8) is situated at a radial distance from the pivot axis(A) of the transfer means (9) which is approximately the same as the distance of the conveying plane, so that when the pack (1) is in the raised position, the carrying plate (18) brings the pack (1) to a position coinciding with the unloading channel (8) simply by means of the angular movement, without having to raise it any further.

12. Device according to one or more of the previous claims, characterized in that the rectilinear lowering movement of the carrying plate (18) of the transfer parts (9) can extend down to approximately the bottom outlet end of the unloading channel (8).

13. Device according to one or more of the previous claims, characterized in that the transfer parts (9) have an L-shaped carrying plate (18), one of whose arms (118) forms the carrying plate that comes into contact with the underside of the pack (1) and the other of whose arms (218) forms a rear wall to retain the pack (1), against which the transverse rear side (101) of the pack rests, especially during the pivoting transfer.

14. Device according to one or more of the previous claims, characterized in that the L-shaped plate (18) is slightly narrower than the distance between the two belts or straps that form the input conveyor (7, 7') and slightly narrower than the continuous longitudinal opening (208) in the rear wall (308) of the unloading channel (8).

15. Device according to one or more of the previous claims, characterized in that the input conveyor may be made up of two independent conveyors (7, 7') arranged one after the other, of which the upstream one (7) cooperates with the means (5) used to collect packs (1) from the stack (3) of packs (1), while the one (7') following it cooperates with the parts (9)

used to transfer the packs (1) to the unloading channel (8).

5

10

15

20

25

30

35

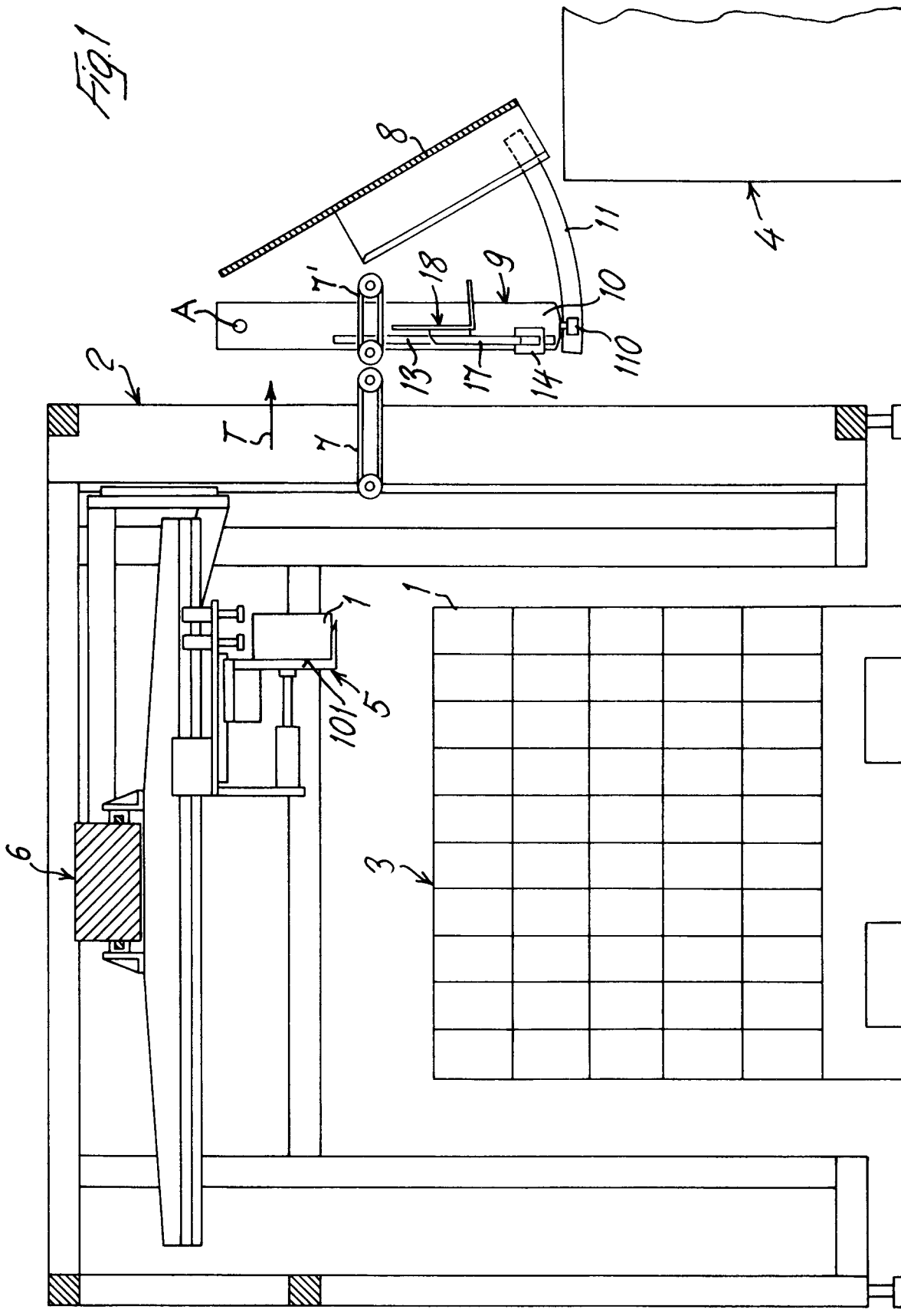
40

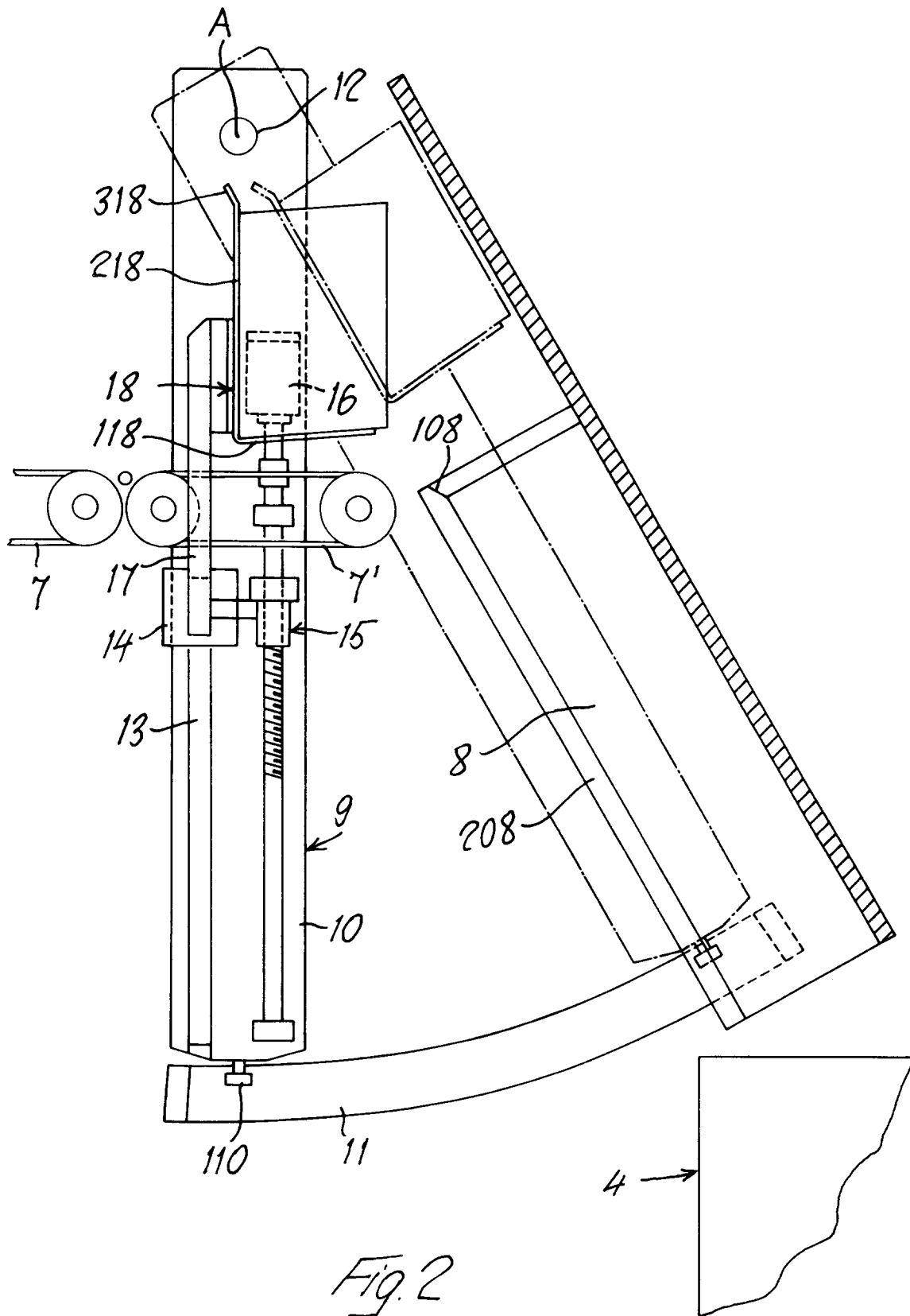
45

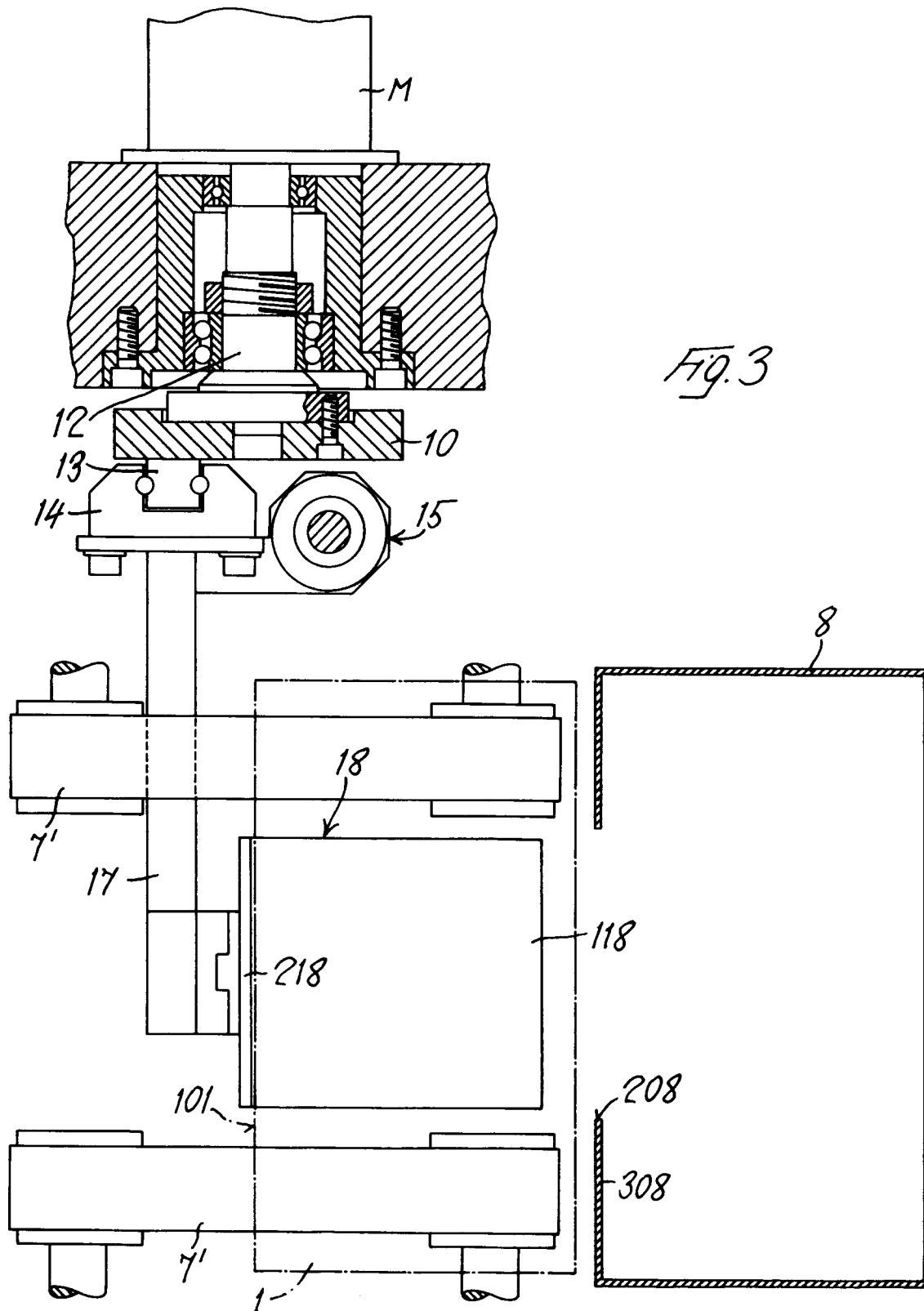
50

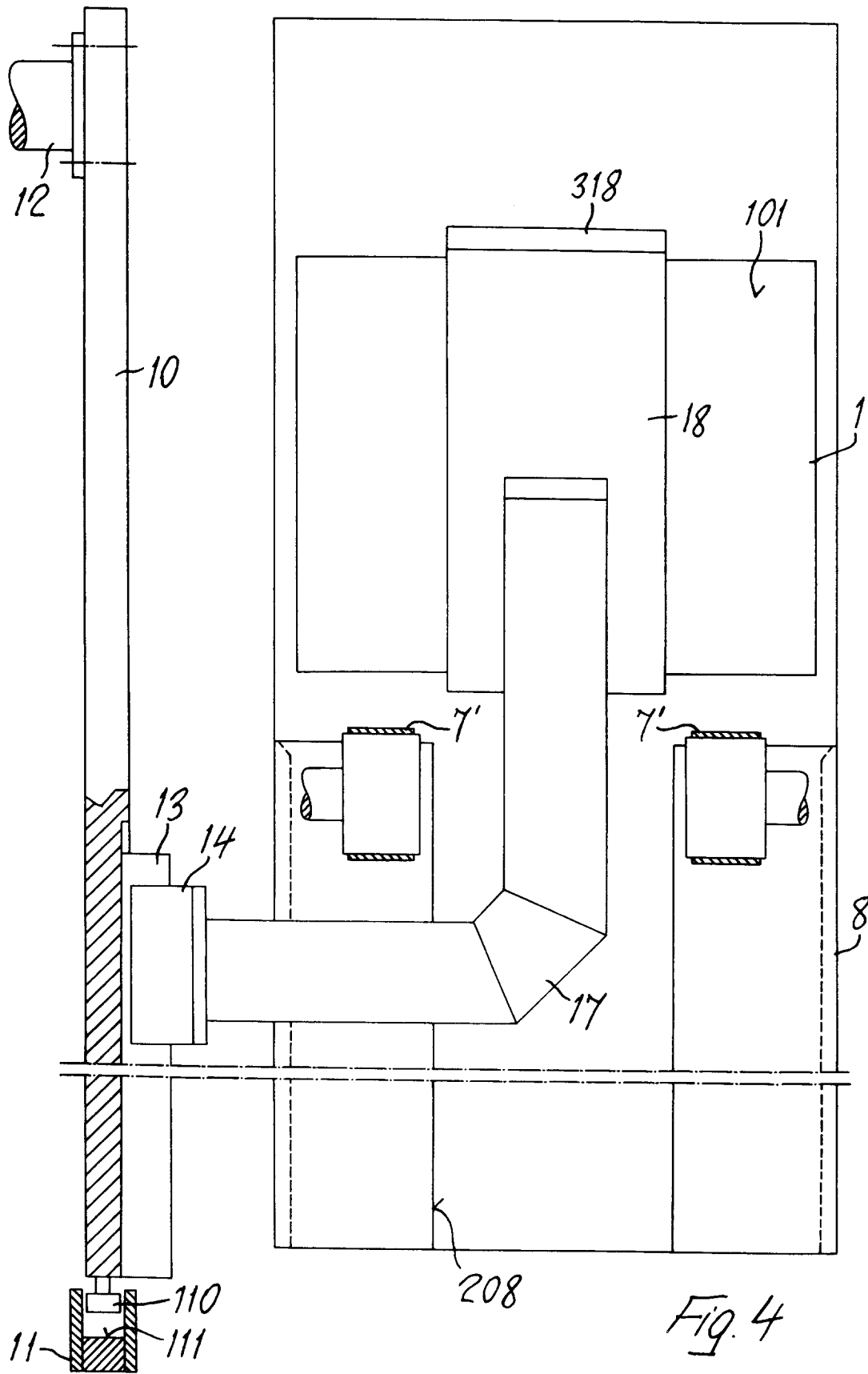
55

7











European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 11 8177

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	EP-A-0 258 597 (FOCKE & CO) 9 March 1988	1-6,11,13	B65H1/30
A	* the whole document *	7-10,12,14-16	

X	DE-A-41 30 216 (GD SPA) 12 March 1992	1,2,4,5,7,14-16	
A	* the whole document *	3,6,8-13	
X	US-A-5 169 284 (BERGER MAURICE ET AL) 8 December 1992	1	
A	* the whole document *	2-16	

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65H
Place of search THE HAGUE		Date of completion of the search 5 February 1997	Examiner Henningsen, O
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, hut published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P4/C01)