(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 077 191 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.02.2001 Bulletin 2001/08

(21) Application number: **99116344.5**

(22) Date of filing: **19.08.1999**

(51) Int. Cl.[7]: **B65H 5/04**, B65H 5/10, B65H 29/38, B65H 29/36, B65H 29/50, B65H 3/32, B65H 29/46, C14B 1/62, B65G 47/61

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(71) Applicant:
Cos-Met Di Compagni Nunzio
41043 Formigine (IT)

(72) Inventor: **Compagni, Nunzio**
41040 Corlo di Formigine (IT)

(74) Representative: **Luppi, Luigi**
Luppi & Crugnola S.r.l.
Viale Corassori, 54
41100 Modena (IT)

(54) System for transferring substantially flat and flexible items, particularly elements of skins

(57) An apparatus for transferring items (4) substantially flat and flexible, includes first conveyor means (3) of said items (4), second conveyor means (5) of said items (4), transferring means (12, 14, 15, 21, 22, 35, 36, 37, 38, 39, 40) for transferring said items (4) from said first conveyor means (3) to said second conveyor means (5), or vice versa, support means (11) for said transferring means (12, 14, 15, 21, 22, 35, 36, 37, 38, 39, 40), moving between an operating position at said first conveyor means (3) and a further operating position at said second conveyor means (5), or vice versa; includes furthermore upper conveyor means (49) of said items (4) and lower conveyor means (46) of said items extending at an intermediate height between said upper conveyor means (46) and a delivery region (45) of said items (4); includes finally carrier means (54) of said items (4) co-operating with clamp means (52) of said items (4) such as said carrier means (54) can insert itself below said items (4) while said clamp means (52) rises a border portion of said items (4).

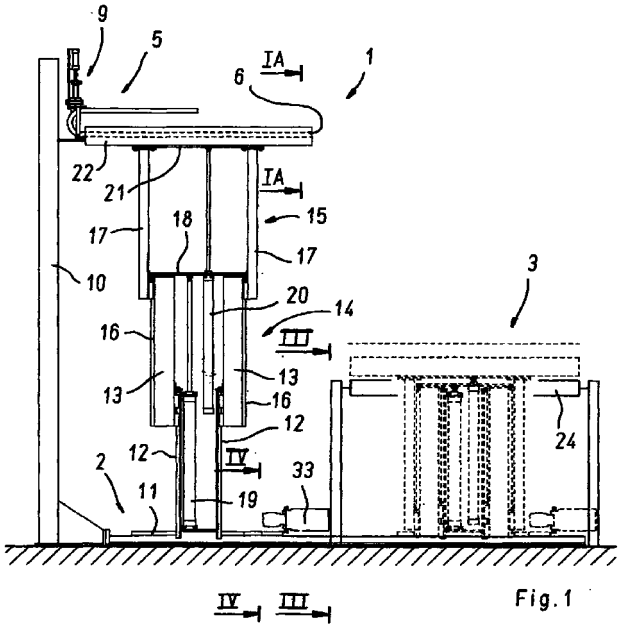

Fig.1

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Description

[0001] The present invention relates to an apparatus and to a method for transferring items substantially flat and flexible, particularly skins.

[0002] The animals skins must be loaded on and unloaded from aerial transfer means from which they are hanging in order to be transferred from a working station to a next working station, during the working process.

[0003] The aerial transferring means generally includes hanging drive means fixed to ceiling and comprising a conveyor chain supporting a plurality of rods which extend from it substantially horizontally and from which the elements of skins are hanging. Each rod shows a "C" shape bent axis which defines a portion of the lower rod working as support member for a respective skin element.

[0004] PCT/EP97/02643 discloses a system for transferring skins where a telescopic arm, horizontally extending, is sliding in vertical direction on a respective support column. The telescopic arm can move between each rod of the aerial transferring means and a ground conveyor lying by side of the aerial transferring means so as to move the skins from the interested rod to the conveyor, or vice versa.

[0005] The support column is placed beside the aerial transferring means, or beside the ground conveyor. In both the cases, the support column involves a certain encumbrance, which can result to be unacceptable in case the installation is accomplished in restricted spaces. PCT/EP97/02643 illustrates furthermore a support frame having portal shape which extends above the aerial transferring means and is provided with support rods, suitable to be operated by end pliers in order to carry out transferring of the skins from the aerial transfer means to a ground conveyor, or vice versa. Also this portal frame involves considerable encumbrance.

[0006] An object of the invention is to improve the existing systems for the movement of the skins, particularly in order to make available the reduction of the encumbrances.

[0007] In one aspect of the invention, an apparatus is provided for transferring items substantially flat and flexible, comprising first conveyor means of said items, second conveyor means of said items, transfer means for transferring said items from said first conveyor means to said second conveyor means, or vice versa, support means for said transfer means, characterized in that said support means are movable between a working position at said first conveyor means and a further working position at said second conveyor means, or vice versa.

[0008] By this aspect of the invention, it is possible to remarkably reduce the overall encumbrance, because the support means can occupy substantially the same space which is occupied by the first and second conveyor means.

[0009] Furthermore by moving the support means between the first conveyor means and the second conveyor means it is possible to achieve a greater precision in the moving of the transfer means.

[0010] In a second aspect of the present invention, apparatus is provided for transferring item substantially flat and flexible, comprising upper conveyor means of said items and lower conveyor means of said items extending at an intermediate height between said upper conveyor means and a delivery region of said items.

[0011] In a third aspect of the present invention, apparatus is provided for transferring substantially flat and flexible items, comprising conveyor means of said items co-operating with clamp means of said items so that said conveyor means is insertable under said items while the clamp means lift an edge portion of said items.

[0012] In this way the stacking and/or unstacking of skins result particularly easy.

[0013] The invention will be better understood and accomplished with reference to the enclosed drawing table, wherein:

Figure 1 is a schematic side view of an apparatus for transferring skins toward a balance conveyor;
Figure 1A is an enlarged section taken along plane 1A-1A of Figure 1;
Figure 2 is a top view of Figure 1;
Figure 3 is a section taken along plane III-III of Figure 1;
Figure 4 is a section taken along plane IV-IV of Figure 1;
Figure 5 is a sketch side view of an apparatus as in Figure 1, but in a version suitable to draw skins from a balance shape conveyor;
Figure 6 is a partial view, enlarged and broken of divaricating means in their closing position;
Figure 7 is a view as in Figure 6, but in a partially open position;
Figure 8 is a view as in Figures 6 and 7, but in a complete opening position;
Figure 9 is a sketch side view of transferring means for transferring skins so that they form a stack of skins superimposed on one another;
Figure 10 is a sketch side view of transferring means for transferring individual skins from a stack of skin already arranged;
Figure 11 is a sketch view of a plant for the working of skins.

[0014] With reference to the Figures 1 and 2, an apparatus 1 includes a base 2 moving between lower conveyor means 3 of skins and upper conveyor means 5 of skins.

[0015] The upper conveyor means 5 includes cantilever rod means 6 which extends substantially horizontally from chain means, not shown, and is hold in place by clamp means 9 supported by a column 10.

[0016] The movable base 2 includes a plate 11 to

which first drive columns 12 are fixed on which members 13 of a first vertically sliding frame 14 are externally slidably engaged.

[0017] A second frame 15 is engaged to slide in a vertical direction with respective further members 17 on external slide ways 16 of the first frame 14.

[0018] An operating pneumatic cylinder 19 extends between the base 2 and a cross-bar 18 of the first frame 14, which drives and controls the vertical displacements of the first frame 14.

[0019] A further pneumatic cylinder 20 extends between the cross-bar 18 and a further cross-bar 21 interconnecting upward the further members 17 and controls the vertical displacements of the second frame 15.

[0020] The further cross-bar 21 includes a "U" shaped portion such to surround over three sides the rod means 6, so as to be able to receive on the own upper borders a region of a skin element 22 initially placed crossover the rod 6.

[0021] As shpwn in Figure 3, the lower conveyor means 3 includes a conveyor 24 and a set of rollers 25 arranged so as to cause a skin element 4 to rise along the direction shown by the arrow F1 toward an intermediate conveyor 26. The intermediate conveyor 26 is horizontally movable by means of an operating cylinder 27 in order to define a space S large enough to allow the frames 14 and 15 to pass through it when the moving base 2 lies below a skin element 4 which is in a transferring position wherein it is partially placed on the intermediate conveyor 26 and partially placed on the rollers 25.

[0022] As shown in Figure 4, the plate 11 is downward provided with wheels 28 with vertical axis laterally engaged in slide ways 29 of a block 30. In order to move the moving base 2 between under the lower transport means 3 and the upper transport means 5 a rack 31 is provided, fixed to the block 30 and engaged by a pinion 32 of a motor-reducer 33 mounted on the moving base 3.

[0023] With reference to the Figure 5, it is displayed in which manner the second frame 15 is provided with divaricating means 34 comprising a couple of column 35 extending parallel to the further members 17 and externally to them in order to support a couple of upper wings 38 swinging about horizontal axes and a couple of lower wings 37, both the lower wings and the upper wings being hinged in a swinging manner to a rod 37a interconnecting the drive columns 35.

[0024] Operating means 39 is arranged in order to wide open apart the upper wings 38 through lever means 41 from an opening position shown in Figure 6 to a closing position shown by dashed line in Figure 8.

[0025] Further operating means 36 is provided in order to produce, by means of further lever means 43, an angular rotation of the lower wings 37 from a closing position shown in Figure 6 to an opening position shown by dashed line in Figure 8.

[0026] The wide opening apart of the upper wings 38 is used to aid the separation of a skin element 4 from the rod 6 from which it is initially hanging so as to make possible that the skin element 4 is first detached from the rod 6 and then unthreaded from it is a longitudinal direction.

[0027] Divatication of the couple of lower wings 37 is instead used to move away each from the other the borders of the skin element 4 when the skin element 4 is on board of the second frame 15 and assures that the above mentioned borders are spaced between them by an amount greater than the distance S, so as one border is received by the intermediate conveyor 26 and the other is received by the rollers 25.

[0028] In Figure 9, an apparatus 60 is shown for transferring skins initially coming from a conveyor 24 and then transferred from here onto an upper conveyor 49 having a proximal end connected to the conveyor 24 and a distal end ending above a lower conveyor 46 overhanging a building region of a skins stack 45.

[0029] The conveyor 49 shows its own distal end hinged around a fix axis and can accomplish an circular arc R being joint to slide way means 48 moving on vertical drive means 50.

[0030] Transversal drive means 47 is further joint to the vertical drive means 50 onto which a lower conveyor 46 is mounted moving between an extended position Z where it overhangs the region of the stack 45 in order to start to lay thereupon a skin element 4 and a withdrawn position Y where the lower conveyor lies substantially outwards the encumbrance of the stack region 45.

[0031] In this manner, when a skin element 4 coming from the conveyor 24 has to be stored in the stack region 45 it passes from the carrier 24 to the upper conveyor 49 and from here to the lower conveyor 46 which is still lying near its withdrawn position Y and which progressively advances toward its extended position as long as it receives the skin element 4 delivered by the upper conveyor 49 through its distal end. When the skin element 4 lies completely placed on the lower conveyor 46, the conveyor 46 continues to cause the skin element 4 to proceed in an opposed direction with regard to the upper conveyor 49 up when an its advanced border goes down to the stack region 45 and leans on its top. Then the lower conveyor 46 starts to go back towards the withdrawn position Y still delivering consecutive portions of the skin element 4 on the top of the stack region 45 up when all the skin element 4 is stored on the top of the skin region 45.

[0032] As shown in Figure 10, in a further version of the apparatus for transferring skin elements 4 at the beginning lying in a region of a stack 45, sucker type clamp means 52 is provided that may be raised by a pneumatic cylinder 51 supported by a frame 53.

[0033] The clamp means 52 is suitable to operate on a border region of a skin element 4 of a stack 45 by rising it for an amount sufficient to allow belt conveyor means 54 to slip under the skin element partially risen

and take it progressively in charge on itself.

[0034] The convyer 54 is then moved away from the stack region 45 along the direction shown by the arrow F2 on horizontal drive means 54a up when it reaches a position near a transit carrier 55 which delivers the skin element 4 in advance transferred to him by the conveyor 54 to the conveyor 24 in order to move it towards another working station.

[0035] As shown in Figure 11, in a manufacturing plant with an aerial transferring line G an apparatus C can be provided for transferring the skins on the rods 6 as shown in Figures from 1 to 4, associated to an unstacker A, B as shown in Figure 10; furthermore in order to draw the skins 4 from the rods 6 an apparatus D can be provided as described with reference to Figures from 5 to 8, and a skin stacker apparatus E, F as shown in Figure 9.

Claims

1. Apparatus for transferring substantially flat and flexible items (4), comprising first conveyor means (3) of said items (4), second conveyor means (5) of said items (4), transferring means (12, 14, 15, 21, 22, 35, 36, 37, 38, 39, 40) for transferring said items (4) from said first conveyor means (3) to said second conveyor means (5), or vice versa, support means (11) for said transferring means (12, 14, 15, 21, 22, 35, 36, 37, 38, 39, 40), characterized in that said support means (11) is moving between an operating position at said first conveyor means (3) and a further operating position at said second conveyor means (5), or vice versa.

2. Apparatus according to claim 1, wherein drive means (29) extends for said support means (11) between said first conveyor means (3) and said second conveyor means (5).

3. Apparatus according to claim 1, or 2, wherein said transferring means (12, 14, 15, 21, 22, 35, 36, 37, 38, 39, 40) includes a plurality of frame means (12, 14, 15) extending substantially vertically.

4. Apparatus according to claim 3, wherein said frame means (12, 14, 15) includes driving means (12) projecting upward from said support means (11) and fixed to them.

5. Apparatus according to claim 4, wherein frame means (14) is slidably engaged on said driving means (12).

6. Apparatus according to claim 5, wherein further frame means (15) is slidably engaged on said frame means (14).

7. Apparatus according to any one of the preceding claims, wherein said transferring means (12, 14, 15, 21, 22, 35, 36, 37, 38, 39, 40) includes divaricating means (35, 36, 37, 38, 39, 40) angularly moving between a closing position wherein said divaricating means (35, 36, 37, 38, 39, 40) substantially does not interact with said item (4) and an opening position wherein said divaricating means (35, 36, 37, 38, 39, 40) substantially interacts with said item (4).

8. Divaricating means (35, 36, 37, 38, 39, 40) for substantially flat and flexible items (4), particularly skins element of animals, angularly moving between a closing position wherein said divaricating means (35, 36, 37, 38, 39, 40) substantially does not interact with said item (4) and an opening position wherein said divaricating means (35, 36, 37, 38, 39, 40) substantially interacts with said item (4).

9. Apparatus according to claim 7, or 8, wherein said divaricating means (35, 36, 37, 38, 39, 40) includes upper divaricating means (38) hinged at the bottom to rod means (37a).

10. Apparatus according to claims from 7 to 9, wherein said divaricating means (35, 36, 37, 38, 39, 40) includes lower divaricating means (37) hinged at the top to rod means (37a).

11. Apparatus for transferring substantially flat and flexible items (4), comprising upper conveyor means (49) of said items (4) and lower conveyor means (46) of said items extending at an intermediate height between said upper conveyor means (46) and a delivery region (45) of said items (4).

12. Apparatus according to claim 11, wherein said lower conveyor means is associated to drive means (47) arranged so as to allow said lower conveyor means (46) to be movable between a withdrawn position (Y) wherein said lower conveyor means (46) lies substantially out of the encumbrance of said delivery region (45) and an extended position wherein said lower conveyor means substantially overhangs said delivery region (45).

13. Apparatus according to claim 11, or 12, wherein a distal end region of said upper conveyor means (49) is associated to vertical moving means (48, 50).

14. Apparatus according to any one of claims 11 to 13, wherein a proximal end of said upper conveyor means (49) is hinged around a fix axis substantially horizontal.

15. Apparatus according to any one of claims 11 to 14,

wherein said lower conveyor means (47) is associated to vertical moving means (48, 50).

16. Apparatus for transferring items (4) substantially flat and flexible, comprising carrier means (54) of said items (4) co-operating with clamp means (52) of said items(4) such as said carrier means (54) is insertable below said items (4) while said clamp means (52) rises a border portion of said items (4).

17. Apparatus according to claim 16, wherein said carrier means (54) is movable on sliding means (54a) extending between a region near said clamp means (52) and a region near transit carrier means (55).

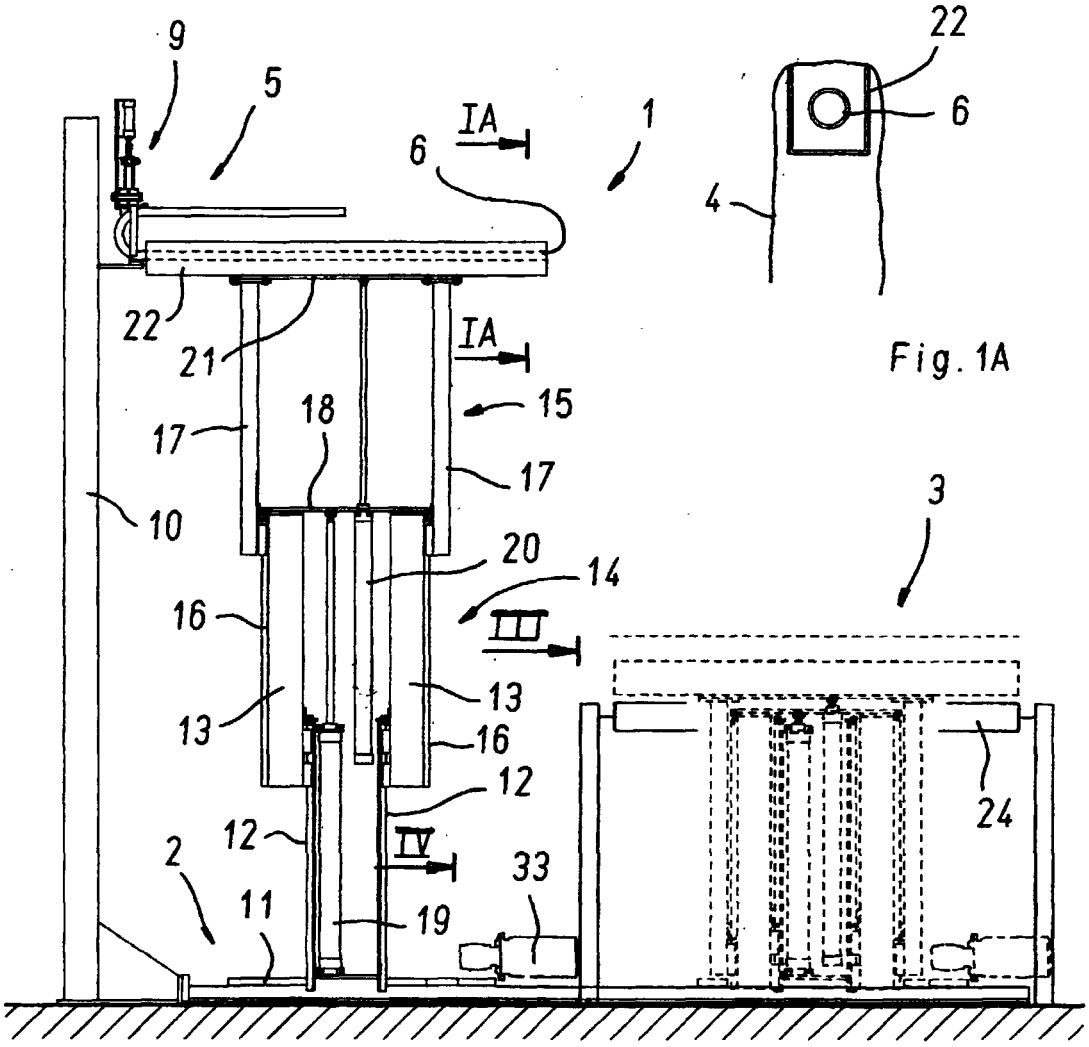

Fig.1

Fig.1A

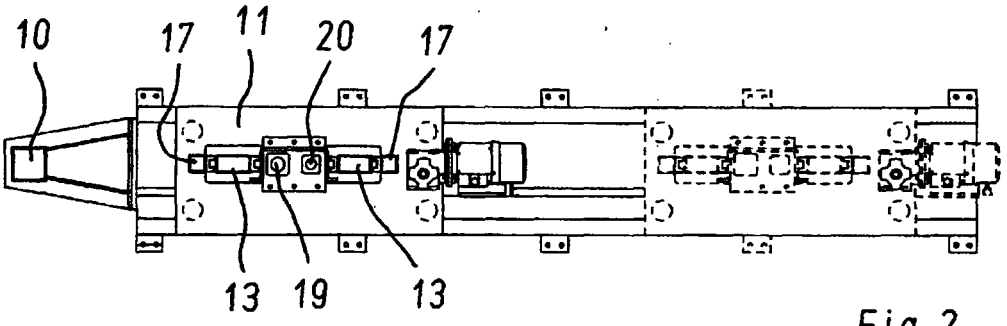

Fig.2

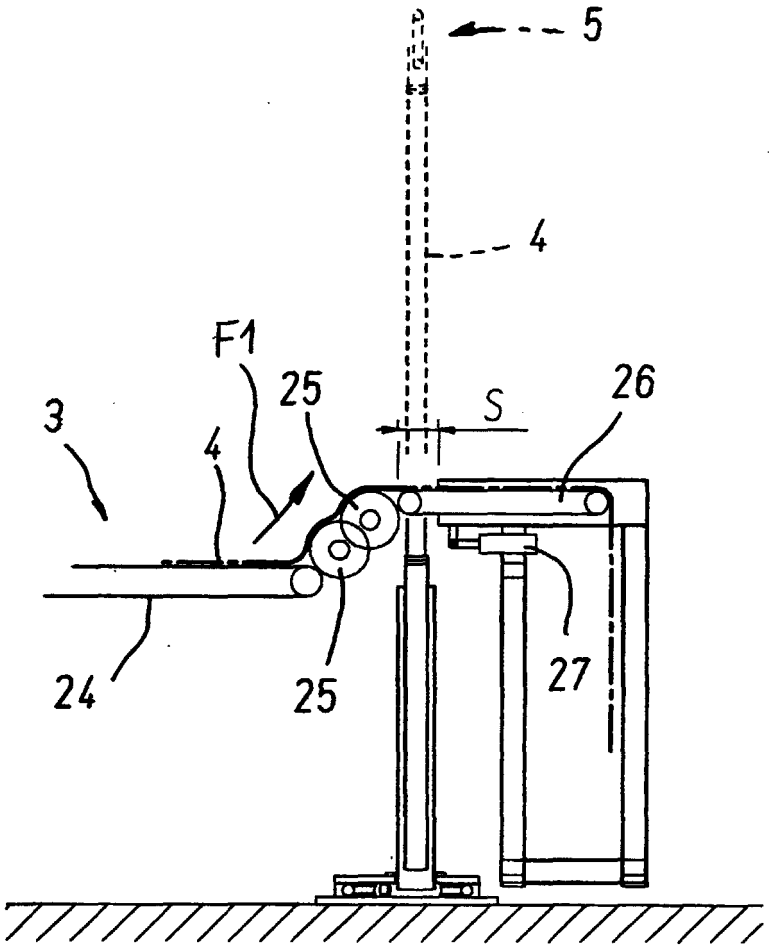

Fig.3

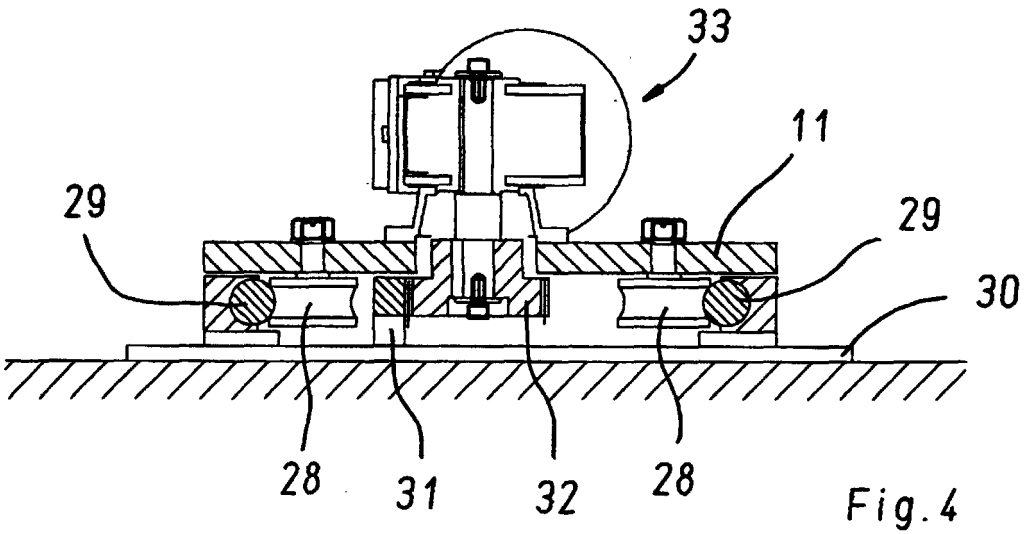

Fig.4

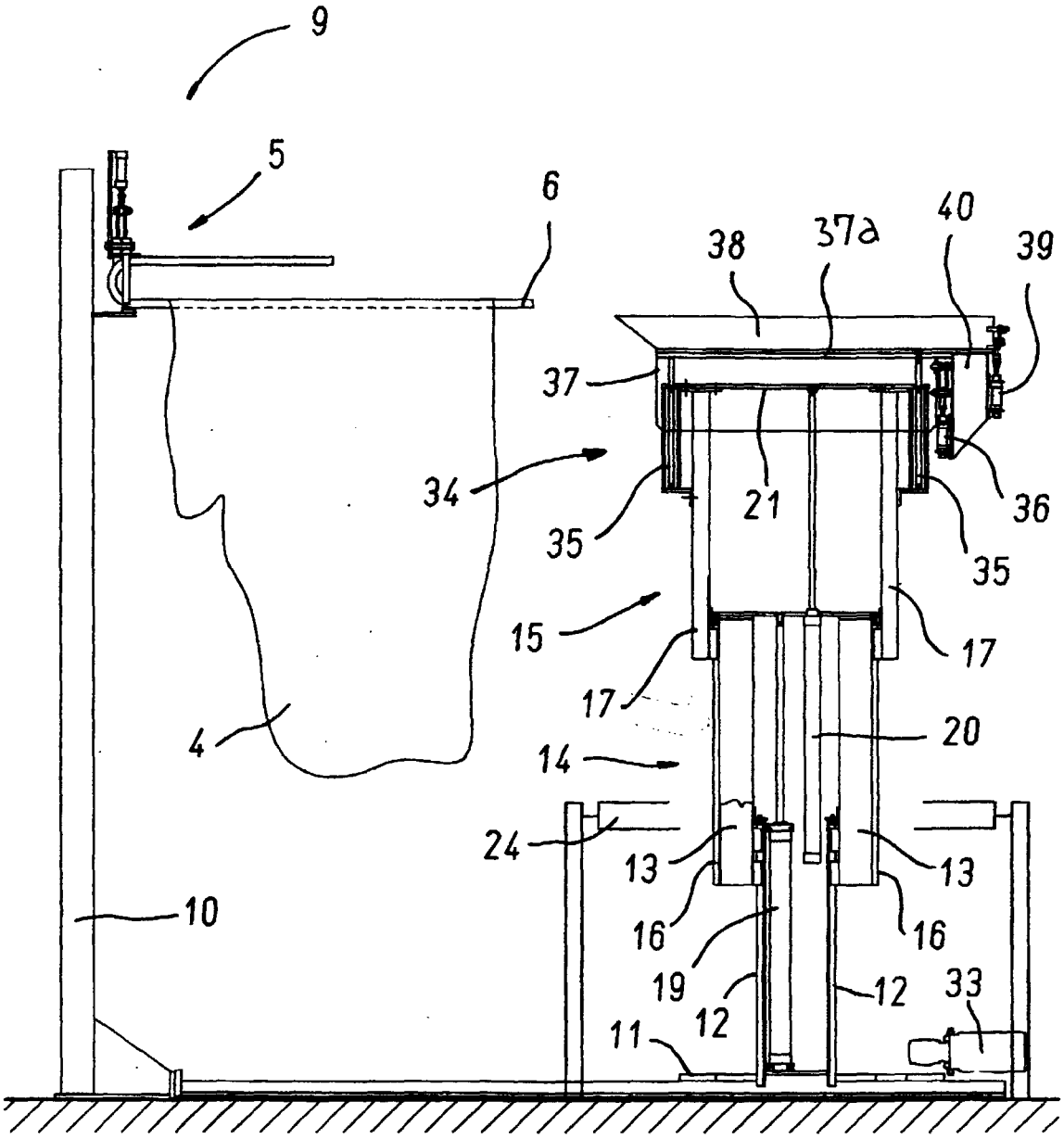
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Fig.5

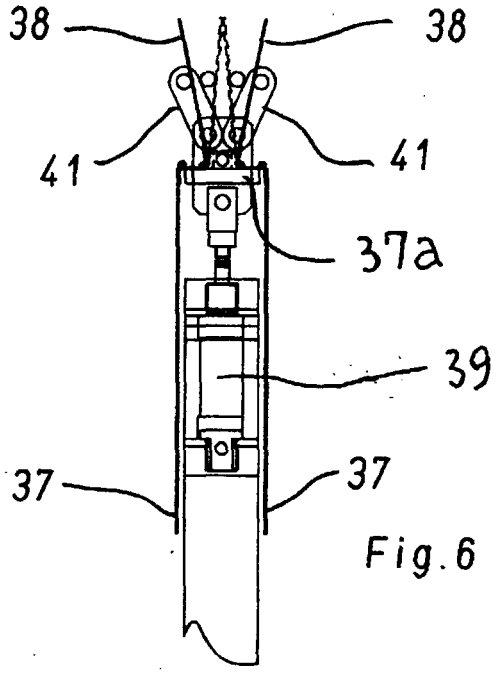

Fig.6

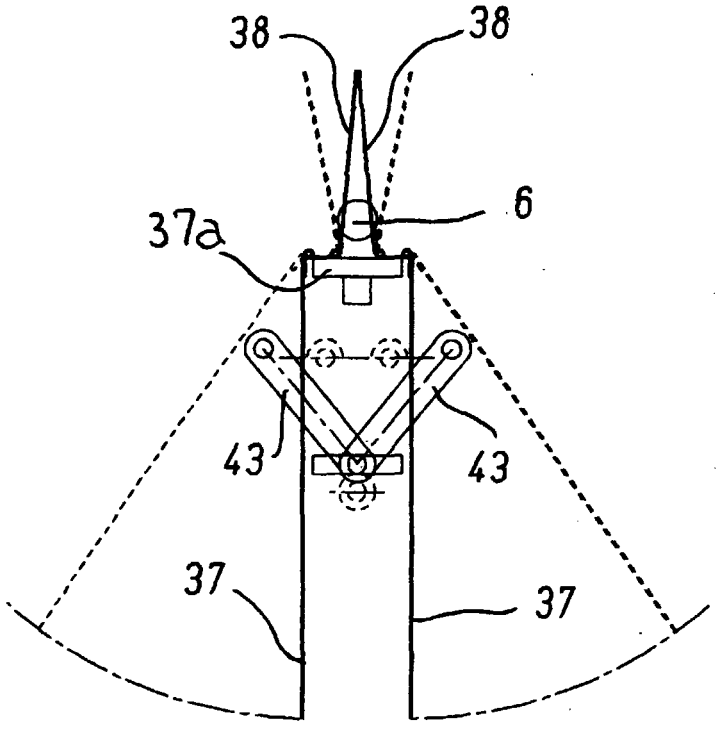

Fig.8

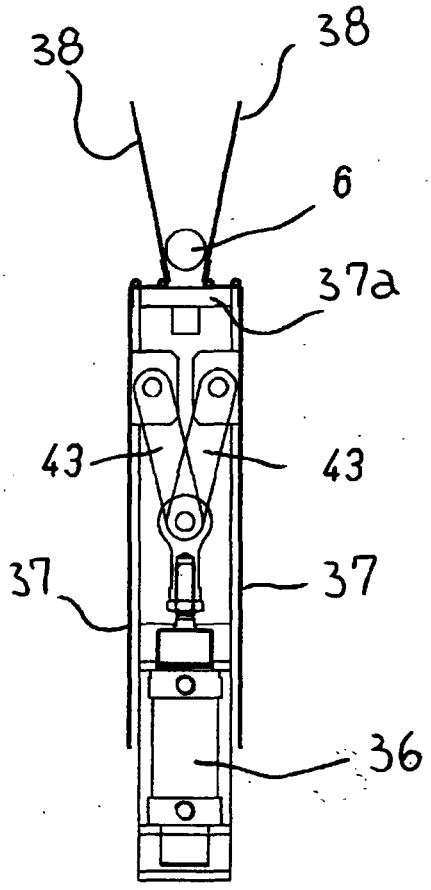

Fig.7

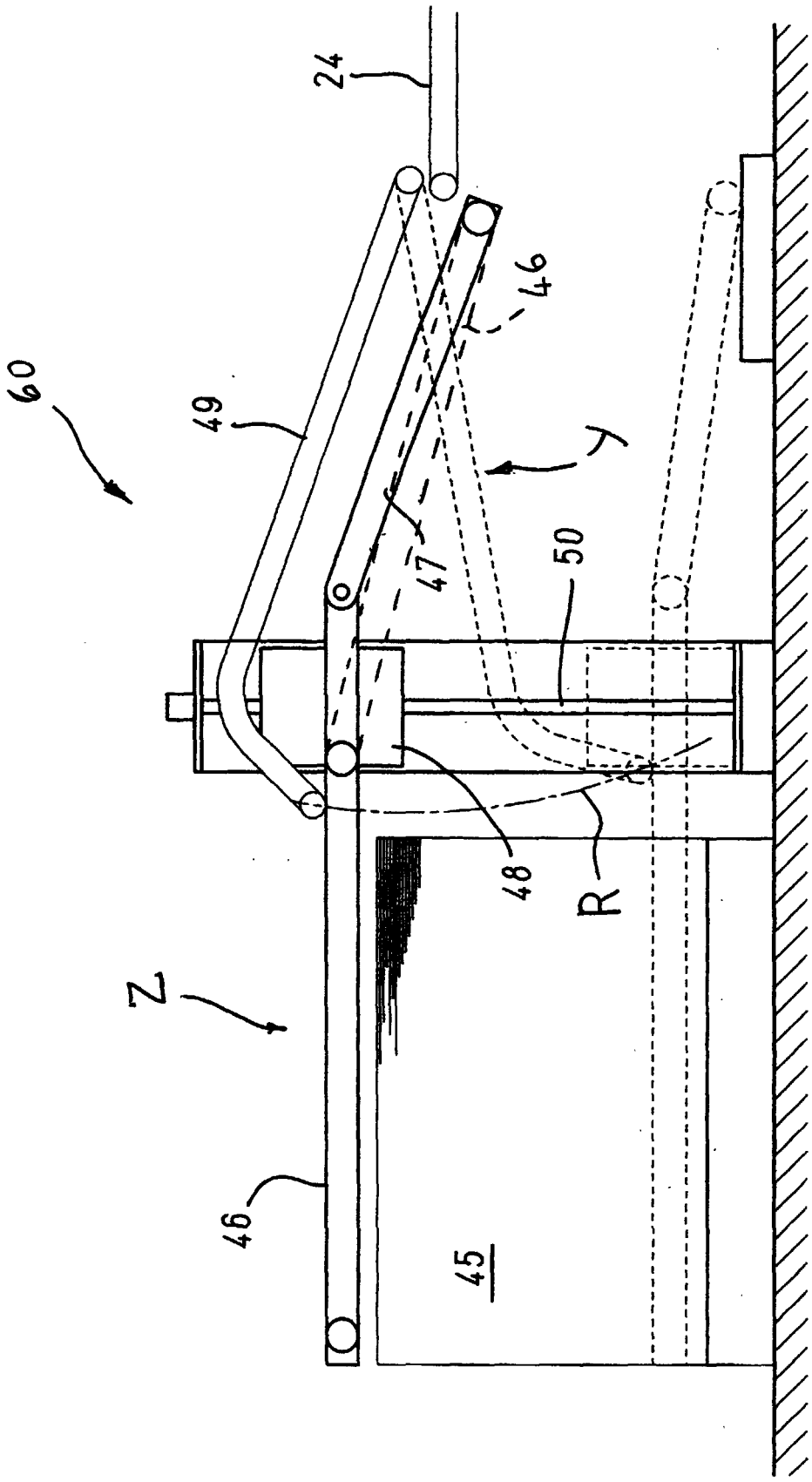

Fig.9

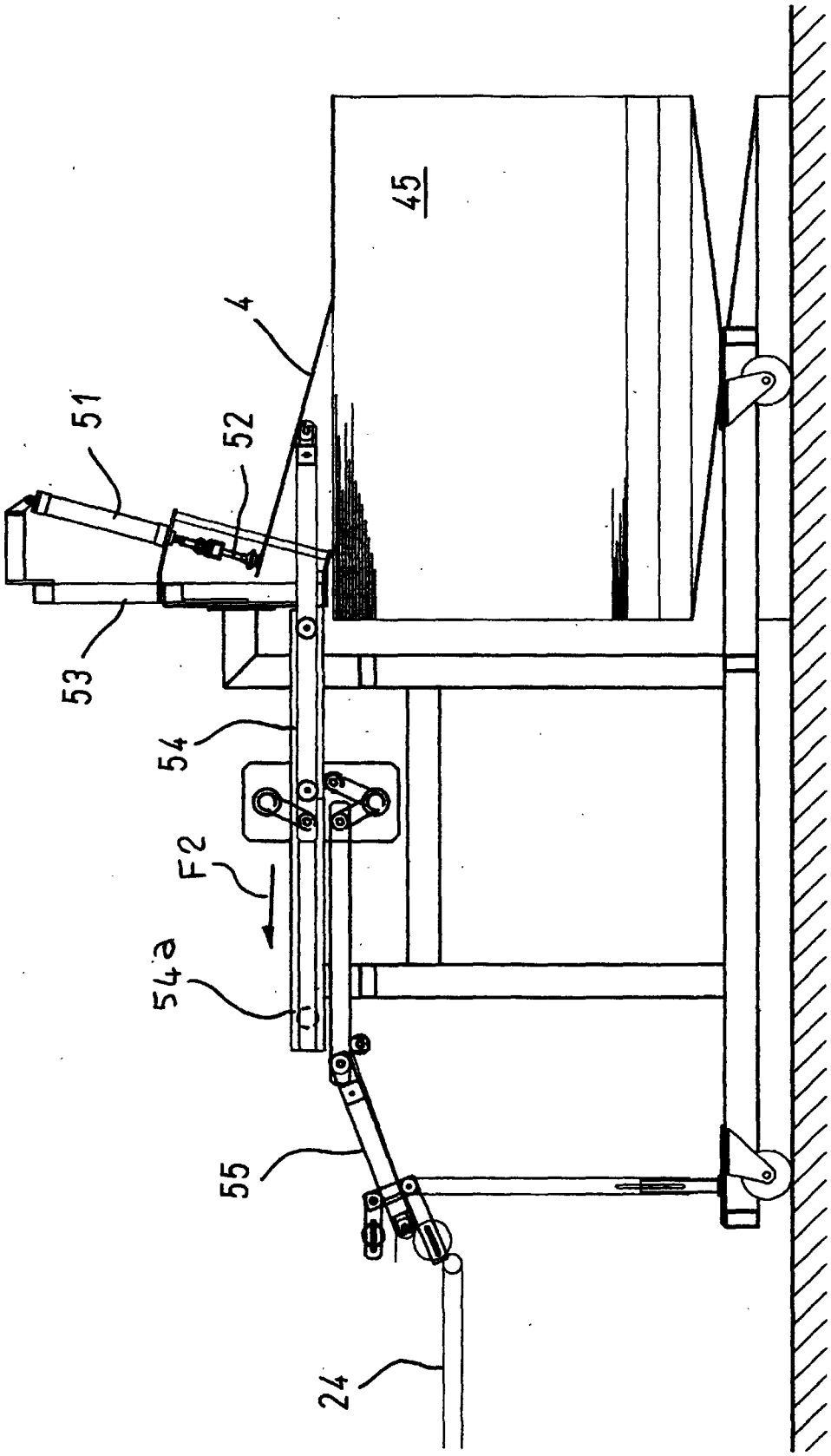

Fig. 10

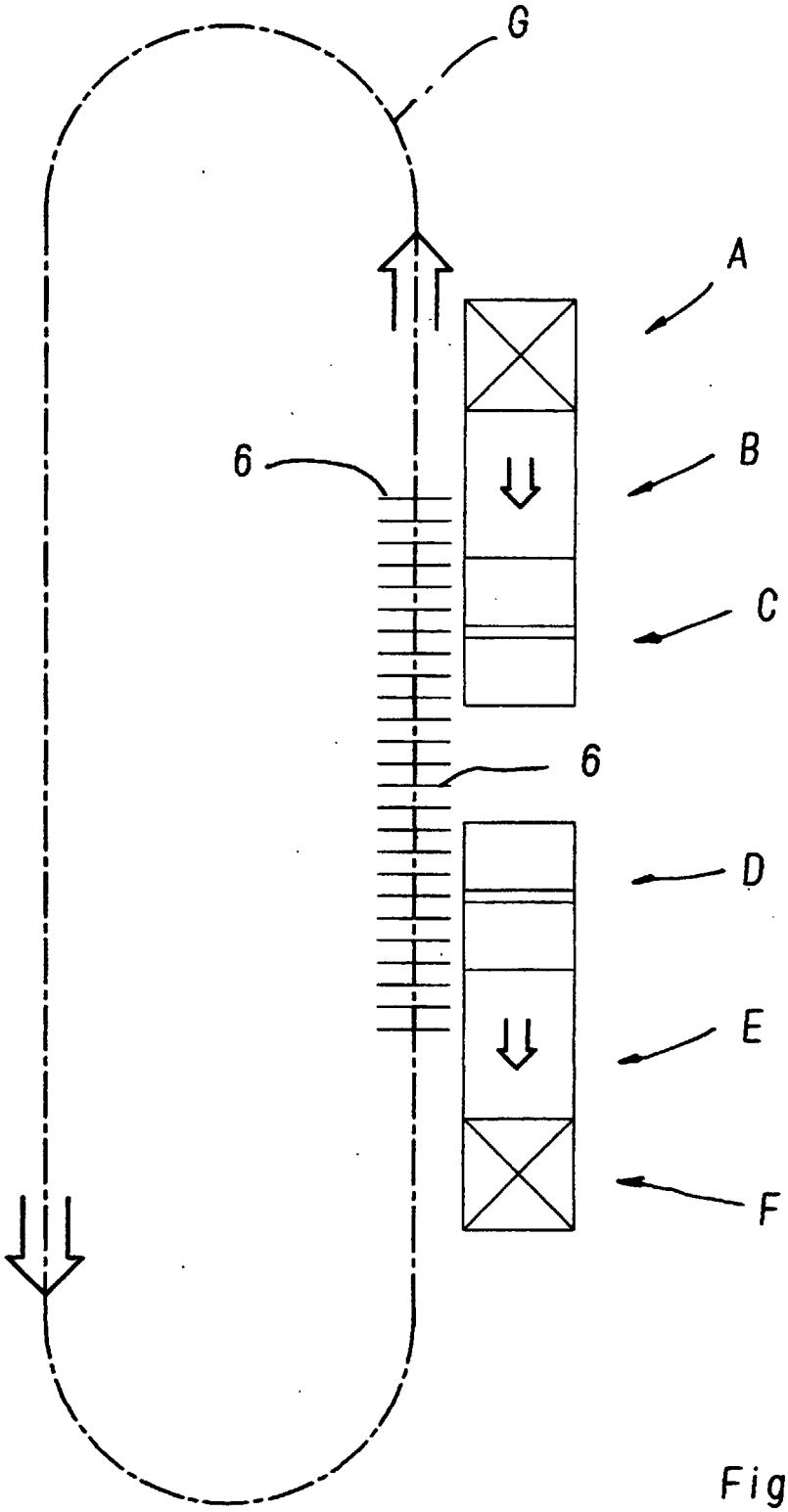

Fig. 11

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 11 6344

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.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65H
B65G
C14B

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
THE HAGUE	19 January 2000	THIBAUT, E

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
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T : theory or principle underlying the invention
E : earlier patent document, but 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

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European Patent Office

Application Number
EP 99 11 6344

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-7

European Patent Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 99 11 6344

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-7

   Apparatus for transferring flat and flexible items

2. Claims: 8-10

   Divaricating means for flat and flexible items

3. Claims: 11 - 15

   Apparatus for stacking flat and flexible items

4. Claims: 16,17

   Apparatus for separating flat and flexible items

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 99 11 6344

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82