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

(11) Publication number: **0 280 106 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **88101825.3**

(51) Int. Cl.4: **B65B 9/02** , B65B 53/06

(22) Date of filing: **09.02.88**

(30) Priority: **13.02.87 IT 1242087**

(43) Date of publication of application:
31.08.88 Bulletin 88/35

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR LI NL SE

(71) Applicant: **LA PACK ITALIA S.R.L.**
Via Bolzano, 41
I-41100 Modena(IT)

(72) Inventor: **Lapadula, Raffaele**
Via Sigonio, 50/1
I-41100 Modena(IT)

(74) Representative: **Porsia, Dino, Dr. et al**
c/o Succ. Ing. Fischetti & Weber Via Caffaro 3
I-16124 Genova(IT)

(54) Packaging method and machine.

(57) Method and automatic machine for orderly arranging articles (C) or products initially in single file and in contact with each other, for removing from said file a leading section comprising a pre-established number of said articles and for packaging this composite article with a transverse arrangement, between a pair of ribbons or films (F-F') of heat-shrink or other suitable material coming from respective reels (B) and united with each other at their leading ends. The packages formed successively by the machine are interconnected with each other by the wrapping material itself and are equally spaced from each other. Composite packages each comprising a pre-established number of composite articles (P) are thus formed, and are then arranged horizontally and stacked on a pallet (66) so that the articles of a layer are interposed and supported between two articles of the adjacent layers. The composite packages (S) constituting the various layers of the palletized stack may contain the same number or, preferably, alternatingly different numbers of composite articles, so that portions of the longer layers protrude symmetrically from the ends of each shorter layer.

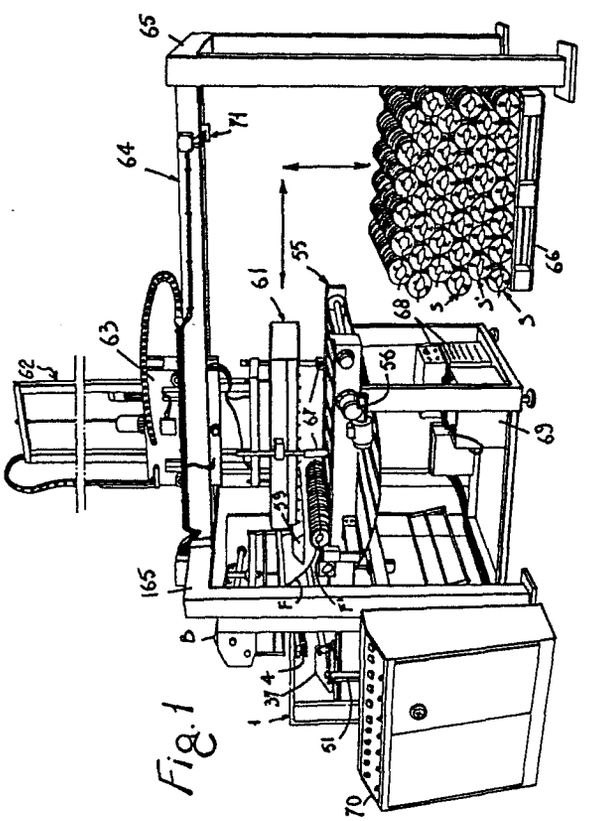

Fig. 1

EP 0 280 106 A1

"Packaging method and machine"

The present invention relates to a method and machine for packaging and palletizing articles of any kind, either loose or pre-packed. The packages may be formed by using two films of heat-shrink or other suitable material unrolled from respective reels and united with each other at their leading ends. If the packaging material is not heat-sealable, the union of said leading ends may be effected by other means, for example, by sewing or by glueing.

More particularly, the method and machine of the invention are adapted for packaging with heat-shrink films and for successively palletizing flat articles in general, for example, covers or bottoms of tins or other containers.

According to the invention, the covers from a forming press are arranged edgewise, after each other and in contact, so as to form something like a continuos horizontal worm. A leading section of this "worm", containing the same pre-established number of covers (termed hereinafter "composite article"), is cyclically removed and transferred to a packaging station. Here, the composite article is discharged onto the initial portion of a horizontal pocket conveyor, through a barrier constituted by two films of heat-shrink material, united with each other at their leading ends and unrolled from respective reels, whereby said composite article will be wrapped by said films. Thereafter, oppositely-facing sealing devices are activated to seal the package parallelly to the composite article, so that the latter is wrapped within said film without excessive freedom. The conveyor carrying the packaged composite article is then advanced one step and a new composite article is discharged onto the initial portion of said conveyor parallelly to the former and between said packaging films. Thus, identical, parallel, equally-spaced packages will be formed which are interconnected by said wrapping films. The width of each wrapping film is suitable larger than that of the composite article, so as to properly extend beyond the ends of said article, and the projecting portions of said films will be then folded over, sealed and tightened by heat shrinkage.

Composite packages are thus obtained which contain a pre-established number of composite articles, whereafter said composite packages are separated by effecting first a double sealing and then a cut therebetween. The composite packages thus obtained are then caught by the pole pieces of an electromagnet and are disposed and stacked onto a pallet. The horizontal stroke of said electromagnet to said pallet is alternatingly differentiated so that the articles of a composite package will be disposed between a pair of articles of the adjacent packages. The composite packages may contain the same number of composite articles, or they may contain alternatingly different numbers of articles, so that one component of the longer composite packages may protrude from both ends of the shorter composite packages.

Further characteristics of the invention and the advantages resulting therefrom will become more apparent from the following description of a preferred embodiment thereof, made by way of non-limiting example in the Figures of the accompanying drawings, wherein:

Figure 1 is a perspective view of the portion of the machine which is used for the formation of the packages and successive palletization thereof;

Figure 2 is a perspective view, in a larger scale and from the same pint of view as Figure 1, of the portion of the machine that is used for making the packages;

Figures 3 and 4 are side elevational and partly sectional views of the portion of the machine which controls the "worm" of covers and which cyclically separates therefrom a leading section of pre-established length and transfers this composite article to the means which will then transfer it to the packaging station;

Figures 5, 6 and 7 show three consturctional details, respectively, of the portion of the machine of Figure 3, taken on the lines V-V, VI-VI and VII-VII, respectively;

Figure 8 is a cross section on the line VIII-VIII of the portion of the machine of Figure 4;

Figures 9 and 10 show a detail on the sectional line IX-IX of Figure 4, during the reception step and discharge step, respectively, of the composite article;

Figure 11 is a diagrammatic top plan view of a possible modified embodiment in the unit for separating and transferring the composite article, said unit being shown in Figure 5.

With reference first to FIgures 1, 3, 4 and 5, it will be noted that the machine comprises a horizontal frame 1 which by means of box-sections 2-102 supports a pair of horizontal, rectilinear, parallel guides 3-103 made of smooth-machined steel whereon the covers from the forming press are supported transversely and edgewise, said covers being in close face-to-face contact so as to form a continuos horizontal worm V. The proper formation of said worm on the guides 2-102 is ensured by the sliding friction co-operation of said covers with a continuous brush 3 secured to the frame 1 so as to be parallel to and equally-spaced from said guides.

At the leading end portion of the worm V there is provided a toothed wheel 5 in mesh with the

edges of the covers constituting said worm in an area which is free from said brush 4, said wheel being rotatably carried by a pivotable support 6 which is suitably connected to the frame 1, said wheel being kinematically connected to an encoder 7 (Figure 6) which counts the number of covers passing progressively under the apparatus discussed herein. When the unit 5-6-7 has detected the presence down-stream thereof of a pre-established number of covers, said unit emits a signal which controls the activation of the means discussed herein.

Below the guides 3-103 there are arranged parallelly thereto a further pair of rectilinear guides 8-108, carried at their ends and intermediately between said ends by supports 9-109 secured to the frame 1. On said guides 8-108 there may be slided, through interposed low-friction means 10-110, a carriage 11 which is moved by a chain 12 connected therewith through a tierod 13, said chain being moved on vertical-axis sprockets 14-114 the last of which is keyed on the output slow shaft of a geared motor 15 secured to said frame 1. The pinion 14 is associated with the structure 1 through the intermediary of adjusting means 16 for tensioning said chain 12.

At the beginning of each operative cycle, the carriage 11 is in the position shown in Figure 3 with solid lines.

The carriage 11 is provided with upright side walls 111-211 which support a pair of horizontal guides 17-117 at the ends thereof, these guides being normal to the guides 8-108 and slidably supporting a pair of slides 18-118 carrying respective arms 19-119 disposed at one side of the worm V. The slides 18-118 are connected by means of connecting rods 20-120 to cranks 21-121 which have different lengths and are, in turn, keyed to a common vertical shaft 22 which, under command, may be rotated by a suitable amount, first for mutually approaching said arms and then in the opposite direction, for example, by means of a drive unit 23 of the pinion-and-rack type secured to the carriage 11, the rack being activated reciprocatingly by a fluid-operated double acting cylinder and piston unit.

The ends of the arms 19-119 are provided with jaws 24-124 made of a suitable resilient and collapsible material and directed towards the worm V and so shaped as to matingly engage the opposite sides of said worm at the equatorial region thereof. The haws 24-124 are usually in the position shown with solid lines in Figure 5 suitably spaced from the worm V, and as shown in Figure 3 said jaws are disposed downstream of the detecting unit 5-6-7.

Immediately upstream of the jaw 24 and in contact therewith there is secured a blade 25 perpendicularly to said arm 19, lying on an imaginary vertical plane and disposed radially with respect to the worm V without usually interferring therewith.

When the unit 5-6-7 has detected the presence downstream thereof of a pre-established number of covers, the unit 23 is activated to mutually approach the arms 19-119 and insert the blade 25 into the worm V with sidewise clamping of the rear end portion of the length P of covers upstream of said blade by the action of said jaws 24-124. Suitable limit sensors (not shown because they are perceivable by those skilled in the art) cause now the activation of the geared motor 15 to move the carriage 11 to the position shown with broken lines in Figure 3, whereby the composite article P which has been severed by the blade 25 is transferred from the guides 3-103 to another supporting structure which will be described below.

Thereafter, the arms 19-119 are opened again and the carriage 11 is moved back to its rest position.

In order to avoid any damage to the covers during the insertion of the blade 25 into the worm V, means may be provided to reduce the axial compression on the worm, at least in the region acted upon by said blade. Figure 11 shows a possible embodiment of said means.

It will be noted in this Figure that the carrige 11, in the return stroke, will be stopped before its tierod 13 moves beyond the dead center of the sprocket 14. At the end of this stroke, pusher members 26-126 associated with the carriage 11 abut against extensions of an auxiliary carriage 27 which may slide on the guides 8-108 or other guides parallel thereto. Springs 28-128 maintain this co-operation between the carriage 27 and carriage 11. Mounted on the carriage 27 are supporting members carrying arms 29-129 capable of oscillating on vertical shafts 30-130 which carry jaws 31-131 on the ends thereof and which may be mutually moved apart and approached by means of a fluid-operated cylinder and piston unit 32 or any other suitable means. The jaws 31-131 are of suitable resilient and collapsible material, are disposed at the equatorial region of the worm V and are similar to the jaws 24-124 described above. The assembly operates as follows.

Before the carriage 11 is re-activated for a new operative cycle, the jaws 31-131 are closed on the worm V so that when the carriage 11 is first moved leftwards as seen in Figure 11 (as stated above, the tierod 13 should move beyond the dead center of the sprocket 14), the jaws 31-131 will also be moved in the same direction, thus releasing the axial compression on the worm V in proximity of the region into which the blade 25 will be inserted when the carriage 11 is stopped at the dead center of the sprocket 14 or due to a temporary stop of the geared motor 15.

Then, when the carriage 11 effects its operative stroke, the springs 28-128 return the carriage 27 to its rest position, while at due time the jaws 31-131 are opened.

The jaws 31-131 might be associated with brushes or flexible extensions (not shown) to preserve the proper formation of the leading portion of the worm each time a pack P of covers (i.e. said composite article) is separated therefrom

Again for the purpose of avoiding any damage to the covers, pressurized air jets, possibly incorporated in the blade 25, might be used to reduce the sliding friction of said blade while being inserted into the worm V.

With reference to Figure 4, it will be noted that the pack P is under the control of the brush 4 while being separated from the worm V.

Upon leaving the guides 3-103 (Figures 4 and 8), the composite article P is supported and guided by a trough-shaped member 33 arranged in continuation of said guides and having a bending radium equal to or slightly longer than the covers C. The end of the trough-shaped member 33 which is near the guides 3-103 is rotatably supported by a suitably shaped plate 34 (see Figure 9), while the other end thereof is closed by a wall 35 the outer face of which is firmly connected to a shaft 36 coaxial with the composite article P and rotatably supported on a plate 37 (Figure 8) which, together with the plate 34, is secured to a carriage 38. It will be noted in Figures 4 and 8 that the carriage 38 is slidably mounted, through the intermediary of low-friction means 39-139, on a pair of horizontal guides 40-140 which are normal to the guides 8-108 and also secured to the frame 1. The carriage 38 is connected at 41, intermediately of its undersurface, to a tierod 42 the opposte end of which is connected to a chain 43 passed on vertical-axis sprockets 44-144, the former being and adjustable driven sprocket and the latter being keyed on the output slow shaft of a geared motor 45 secured to the frame 1.

Keyed on the shaft 36 is a crank 46 connected at 47 to a multiple-plunger telescopic tierod 48 whose outer sleeve has a portion that is restrained by two shoulders 49-149 and slides in a bushing 50 which is movably supported in a ball-and socket manner on a support 51 secured to the frame 1. The crank 46 is provided with a clutch device 52 comprising a spring-loaded ball engaged in a recess formed in the adjacent plate 37.

After the composite article P has been arranged on the trough-shaped member 33, the geared motor 45 is activated and the carriage 38 is moved to the position shown in Figure 8 with broken lines, while a suitable guide means (not shown) supports the end portion of the composite article P that has been acted upon by the blade 25. During this movement of the carriage 38, the telescopic tierod 48 is extended and its shoulder 149 co-operatingly engages the stationary support 51 which, by reaction, causes the lever 46 to oscillate clockwise, with resulting rotation of the trough-shapted member 33 about its longitudinal axis to the position shown with broken lines in Figures 8 and 10. The composite article P is, therefore, discharged by gravity from the trough member 33 onto an area to be described below, whereafter the carriage 38 moves back to its rest position with the retraction of the tierod 48, co-operative engagement of the shoulder 49 with the stationary support 51 and resulting return of the trough member 33 to the position shown with solid lines in Figures 8 and 9.

When the composite article P is discharged from the trough member 33, it is restrained at the ends thereof by a pair of stationary parallel guides 53, and is also restrained by the flaps K of two ribbons or films F-F′ unrolled from respective reels B and controlled by longitudinal unrolling and tensioning devices. In the Figures 1 and 2, only the upper reel B is shown. The films F-F′ have a width larger than that of the composite article P so as to extend symmetrically and suitably from both ends of said article and to form the said restraining flaps K.

The composite P article discharged from the trough-shaped member 33 rests between a pair of parallel rods 54 carried by the initial portion of the upper horizontal stretch of a chain conveyor 55 actuated by a geared motor 56 (see Figures 1 and 8).

After the composite article P has been discharged and the trough-shaped member 33 has been moved back, two oppositely-arranged co-operating heat-sealing units 57-157 are moved toward each other to meet at the equatorial region of the covers, so as to force the films F-F′ to enwrap the article P in a sufficiently accurate manner and to unite said films by means of an efficient transverse seal which is then cooled by suitable means. On completion of the sealing step, the conveyor 55 advances one step and the packaged article is moved to the position shown with solid lines in Figure 8, with their ends in front of respective hot air blowers 58 (Figure 2) which cause the flaps K of the packing material to heat-shrink onto the ends of said article P, so as to tighten it firmly. This station comprises as well a hood 59 (Figures 1-2-8) extending over the whole length of the packaged article and connected intermediately to a hot air blower (not shown). By means of this hood, at least the first and the last packs of one composite package are submitted to heat-shrinkage (see below).

These packaging operations go on as described above until a pre-established number of

composite articles P, for example seven composite articles, have been sequentially packaged, suitably spaced apart, between the films F-F'. After the last heat-sealing operation, the conveyor 55 advances either one entire step or a fraction of a step, whereafter the sealing means 57-157 are activated again and at the same time a hot wire 60 or an equivalent means, such as a blade, is raised to effect, between the two parallel adjacent seals, an intermediate cut parallelly to said seals, with resulting separation of a composite package comprising seven composite articles P, from the packaging films F-F', which are thus interconnected at their leading ends and are ready for a new operative cycle.

In the next operative step (Figures 1 and 2), the composite package S comprising seven composite articles P is moved away from the hood 59 and is suitably positioned below the pole pieces of an electromagnet 61 wich is associated with a lifting/lowering unit 62 mounted on a powered carriage 63 which, under command, may be caused to slide on a guiding assembly 64 parallel to the longitudinal axis of said conveyor 55 and secured at the ends thereof to the central portion of two portal-like structures 65-165 which are fixed to the floor. Under command, the electromagnet is lowered onto the composite package S and seized it because the composite articles P are of ferromagnetic nature, wherefter said electromagnet is lifted and transferred as far as the other end of the guide 64. Here, the carriage 62 is stopped and the electromagnet 61 is lowere to the level of a pallet 66 which rests on the floor. Photoelectric sensors 67 associated with the platform carrying the electromagnet 61, will stop the latter automatically in its lowering movement onto the pallet 66 and successively onto the layers of packages discharged previously. At the end of the lowering movement onto the pallet 66, the electromagnet 61 is de-energized to discharge the package S onto said pallet, whereafter said electromagnet is returned to the initial position above the conveyor 55.

The successive composite package S' made by the machine and stacked on the package S, preferably, comprises one composite article P less than the package S, and the horizontal stroke of the carriage 63 is suitably staggered with respect to the preceding stroke so that the composite articles P of the new composite package S' may be laid down onto pairs of articles of the underlying package or layer. The next composite package S laid down onto the pallet will comprise again seven composite articles P that will be aligned with those of the bottom layer. The strokes of the carriage 63, therefore, are alternatingly differentiated, and this is carried out by suitable sensors 71 properly mounted on the guiding assembly 64.

The composite articles at the ends of the longer layers S protrude symmetrically from the ends of the shorter layers S', so that the orderly formed stack of articles on the pallet 66 will be more stable. It is now apparent that, in such a stacking system, at least the end packs of each layer should be more effectively tightened by the heat-shrinkage effected by the diffusion hood 59 described with reference to Figures 1, 2 and 8.

It is to be understood that in contrast with what has been described and shown, the layers S and S' may be inverted with respect to the order that is shown in Figure 1, or they may comprise the same number of composite articles P.

When fully loaded, the pallet 66 is moved away and replaced with an empty pallet.

With reference to Figure 1, a current rectifier, diagrammatically shown at 68, is used for feeding the stacking electromagnet 61, and an electrical accumulator 69 is connected for buffer feeding purposes. The numeral 70 indicates an electrical control cabinet.

No constructional details are given herein of the driving means for the carriage 63 and of the lifting/lowering unit 62 associated therewith, since they may be easily realized and constructed by those skilled in the art.

It is to be understood that the method and the machine described herein may be used to package and palletize articles other than covers, even if not flat-shaped, not composite, and, if desired, prepacked articles such as bags of loose articles.

Instead of the films F-F' of heat-sealable material, webs may be ued of other heat-sealable material, such as polythene-paper sheets, or of a material which may be united otherwise, such as by sewing, by glueing, or by an adhesive automatically dispensed by suitable devices. If the article to be packaged is not of ferromagnetic nature, the electromagnet 61 may be replaced by any other equivalent means for gripping and handling the composite packages.

Claims

1. A method of packaging and palletizing any product, for example, covers or bottoms (C) or other flat-shaped articles, characterized by the following operating steps:

-arrangement of said articles (C) in single file and in contact with each other, so as to form thereby a continuous and, preferably, horizontal worm (V);

-separation, from the leading portion of said worm (V), of a section thereof containing a preestablished number of articles, said section being termed hereinafter "composite article" (P) to be

packaged;

-insertion of the composite article (P), with a transverse positioning, between a pair of films (F-F') of heat-shrink material, united to each other at their leading ends and having such a width as to suitably extend beyond the ends of said composite article;

-closure of the package by a heat-sealing operation parallelly to the packaged composite article and close to the latter so that said package has no excessive clearances;

-closure of the ends of said package by means of local heat-shrink operations;

-optional heat-shrink treatment of all, or of some, of the formed packages, over the entire extension of their plan view dimensions:

-removal of the package from the forming station and successive insertion of a new composite article (P) between the films (F-F') and repeating of the steps described above until composite packages are formed which comprise a pre-established number of composite articles which are parallel to each other, equally spaced from each other and interconnected by the same material that enwraps them;

-separation of the cyclically defined composite package (S-S') from said films (F-F'), by effecting on said films a double transverse sealing and a cut therebetween, whereby said films will be again united at their leading ends and ready for the next operative cycle;

-the composite packages (S-S') containing either the same number or alternatingly different numbers of composite articles (P) and said composite packages being automatically stacked onto a pallet with a horizontal arrangement so that the composite packages of one layer rest between two composite articles of the adjacent layers.

2. A method according to the preceding claim, characterized by the fact that the more extensive heat-shrink treatment may be applied only to the first and the last components of each composite package (S-S'), so as to give said components a greater resistance since some of them are intended to protrude overhangingly from the underlying composite package stacked on said pallet.

3. A method according to the preceding claims, characterized in that instead of said heat-shrink films (F-F') there may be used other suitable packaging materials which may be mutually heat-sealed or united by means of other techniques for example, by sewing or by using any suitable glue or adhesive.

4. A machine for packaging and palletizing articles, more particularly flat-shaped articles such as covers, bottoms or the like, characterized in that it comprises:

-guiding and restraining means (3-103-4) for the formation of a "worm" (V) of articles (C);

-means (5-6-7) for counting the number of articles (C) passing through a stationary, pre-established, initial region of the means mentioned in the preceding item;

-means (24-124-25) for separating, under command, from said worm (V), a leading section containing a pre-established constant number of articles, i.e. a so-called composite article (P);

-means (33) for receiving the composite article (P) and discharging it at a packaging station onto the initial portion of the upper horizontal stretch of a pocket conveyor (55);

-a packaging station comprising two rolls (B) of heat-shrink film, means for unrolling said films (F-F') from said rolls, and heat-sealing means (57-157) and cutting means (60) for transversely operating on said films which are mutually united at their leading ends and are disposed in front of said pocket conveyor (55);

-stationary guiding means (53) restraining the composite article (P) at the ends thereof when it is introduced into the packaging station;

-generators of hot air (58) for heat-shrinking the end flaps (K) of each package after it has been heat-sealed and suitably removed from the heat-sealing station;

-at least a hood (59) having incorporated therein a generator of hot air, arranged above the package closed at its ends by the hot air generators, and of such dimensions as to operate on said package over its entire plan view extension;

-a lifting and transferring device (61-62-63) which at due time seizes the composite packages (S-S') arranged on the pocket conveyor (55) and stacks them horizontally onto a pallet (66).

5. A machine according to the preceding claim, characterized by the fact that the guiding means for the formation of the worm of articles comprise a rectilinear horizontal channel comprising at the bottom thereof a pair of longitudinal, parallel, smooth guides (3-103) and at the top thereof a longitudinal brush (4) which is parallel and equally spaced from said guides.

6. A machine according to the preceding claims, characterized by the fact that the means for cyclically separating a composite article (P) from said continuous worm (V) comprise a pair of jaws (24-124) which by means of suitable mechanisms (18 to 23) clamp laterally the leading portion of said composite article, one of said jaws being provided with a blade (25) which is inserted radially into said worm to separate said composite article which is then pushed axially to be discharged from said guiding channel by said assembly of jaws and blade mounted on a powered carriage (11) which is caused to slide on rectilinear guides (108) parallel to said channel (3-103-4).

7. A machine according to the preceding claims, characterized by the fact that, immediately upstream of the jaws (24-124) which clamp laterally the leading portion of the composite article (P) cyclically separated from the continuous worm (V), there is provided a further pair of independent jaws (31-131) which clamp said worm and are slightly dispaced in a direction contrary to the direction of advance of said worm (V) prior to the insertion into said worm of the blade (25) which separates the composite article to be packaged, with the purpose of reducing the sliding friction between said blade and article so as to guard said article against any damage.

8. A machine according to claim 7, characterized by the fact that said supplementary jaws (31-131) which reduce the axial thrust on the worm (V) before said blade (25) is inserted thereinto to separate the composite article therefrom, are mounted on a carriage (27) which is brought into its active stroke due to the interference thereof with the carriage (11) for the main jaws (24-124) and which is brought back into its rest position by resilient means (28-128).

9. A machine according to the preceding claims, in which the means for controlling the length of the composite article (P), comprise a toothed wheel (5) which meshes tangentially with the worm (V) and which is connected to a programmable encoder (7) which emits the command for activating the means which cyclically separates said composite article from said worm.

10. A machine according to the preceding claims, in which the means for receiving the composite article from the channel wherein said worm (V) is guided and compacted, comprise a trough-shaped member (33) supported by a powered carriage (38) so as to be pivotable about its axis, said powered carriage being movable on horizontal guides normal to the axis of said trough-shaped member, the arrangement being such that upon reception of the composite article said trough-shaped member is moved toward the packaging station where it is rotated about its axis by suitable means to discharge said composite article onto said station, whereafter said trough-shaped member is moved back to its initial position and orientation to repeat a new operative cycle, suitable guiding means being provided to properly support at least the free end of the composite article when the trough-shaped member is moved toward the packaging station.

11. A machine according to the preceding claims, in which the end of said trough-shaped member (33) which is adjacent said channel (3-103-4) where the worm (V) is formed is open and is rotatably supported by an underlying plate (34), while the other end of said trough-shaped member is closed by a wall (35) connected exteriorly to a shaft (36) which is axially in line with said trough-shaped member and is rotatably supported by a plate which, together with said plate (34) is overhangingly connected to said carriage (38) to effect the translatory movements of said trough-shaped member.

12. A machine according to the preceding claims, in which said rectilinear brush (4) acting on the top of the articles in the channel where said worm (V) is formed, is extended beyond said channel so as to perform its function also on the composite article (P) being transferred onto said trough-shaped member (33).

13. A machine according to claim 10, in which the means for oscillating said trough-shaped member (33) which carries the composite article to the packaging station comprise a crank (46) keyed on the shaft (36) which rotates said trough-shaped member and connected by a telescopic tierod (48) to a stationary support (51), said crank being provided with a clutch device (52) co-operating with the adjacent plate (37) which rotatably supports the end shaft (36) of said trough-shaped member.

14. A machine according to the preceding claims, in which the means for seizing and removing the composite package from the forming station, when the packaged articles are of ferromagnetic material, comprise an electromagnet (61) carried by a lifting/lowering unit (62) associated with a powered carriage (63) which, under command, moves said electromagnet from the area where it seizes the composite package to the area where there is positioned a pallet (66) onto which said composite packages are stacked.

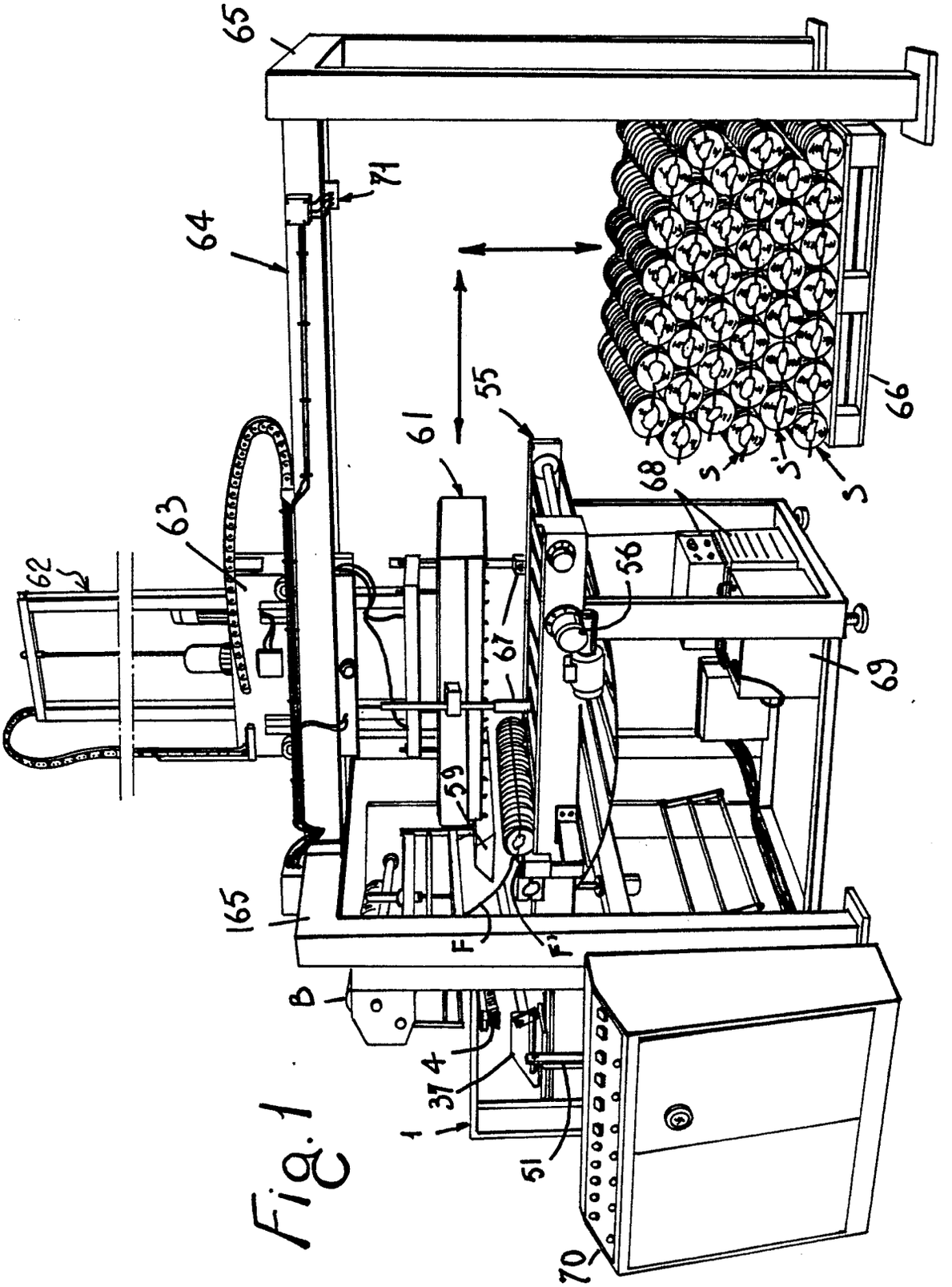

Fig. 1

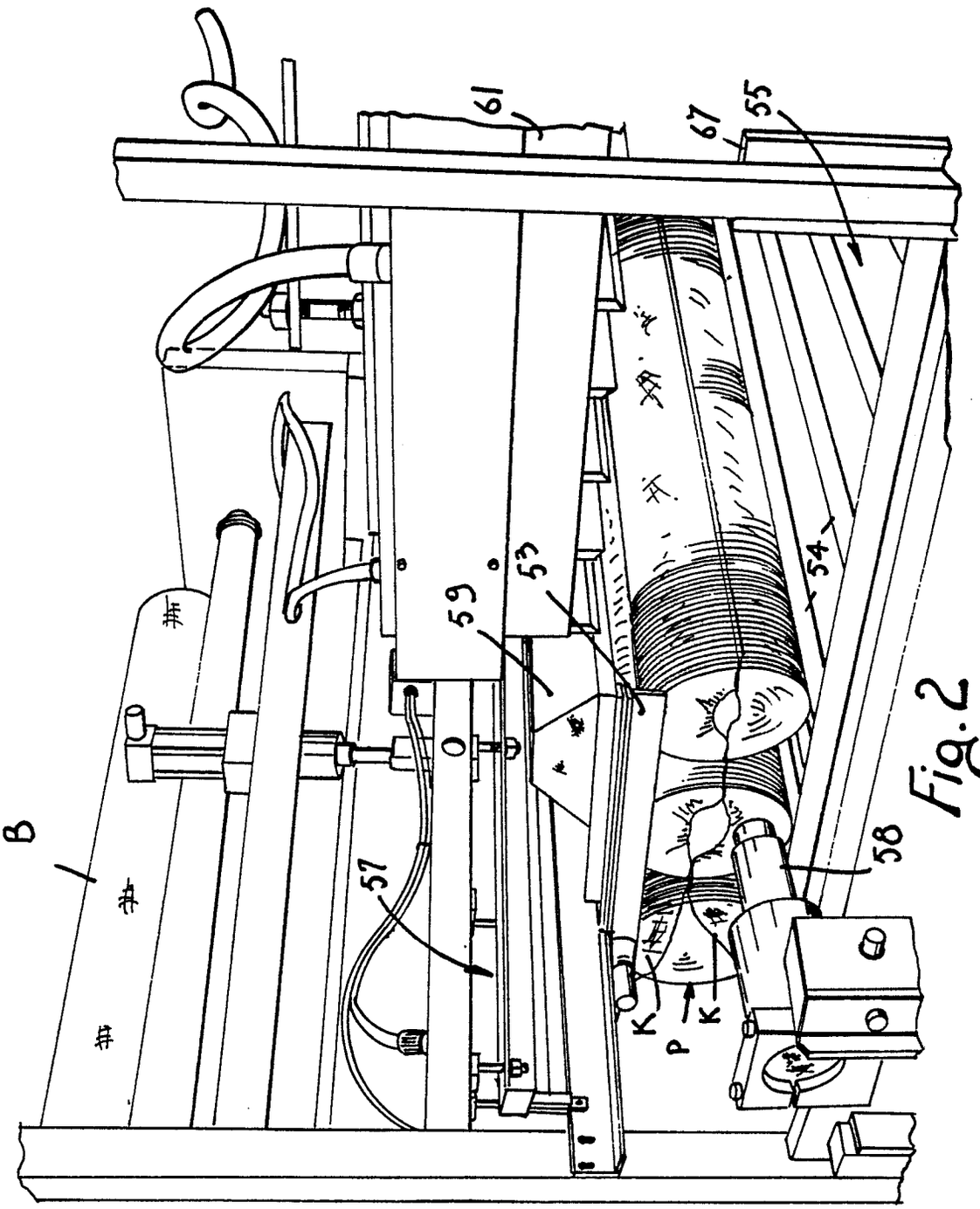

Fig. 2

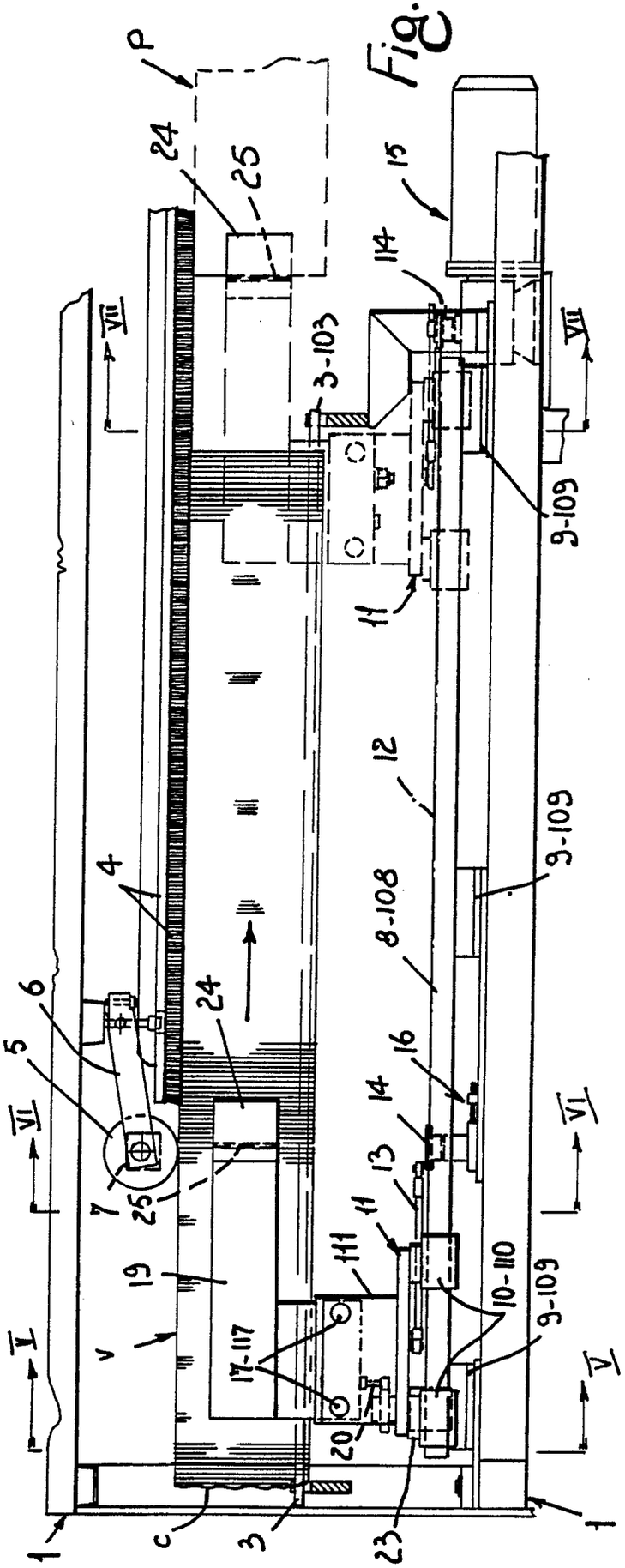

Fig. 3

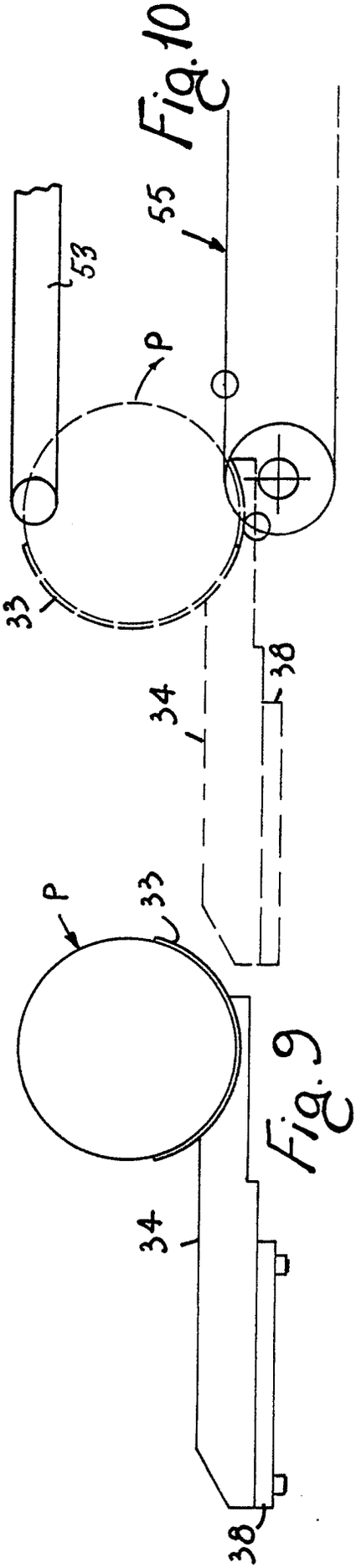

Fig. 10

Fig. 9

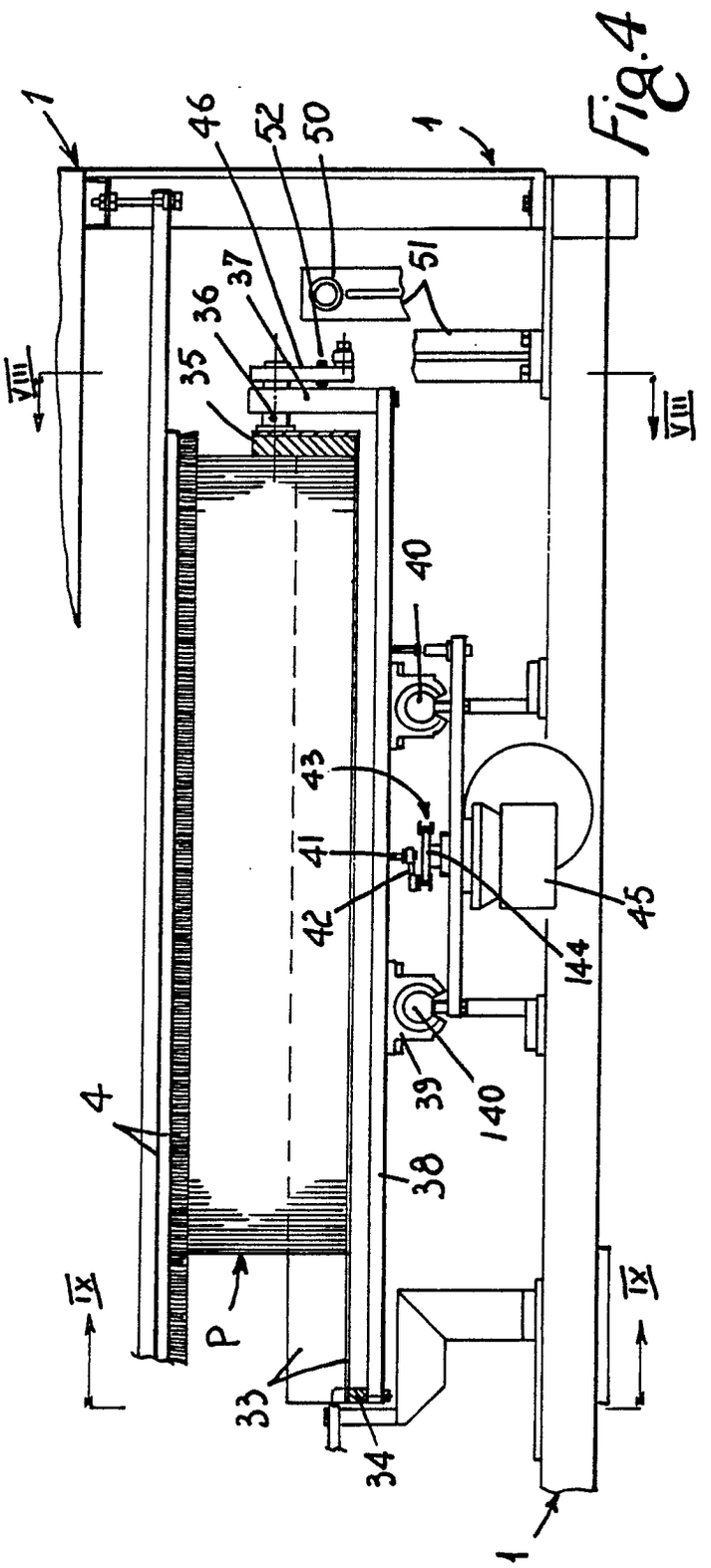
1
46
52
50
1
51
37
36
35
VIII
VIII
40
43
41
42
45
144
39
140
38
4
IX
P
IX
33
34
1

Fig.4

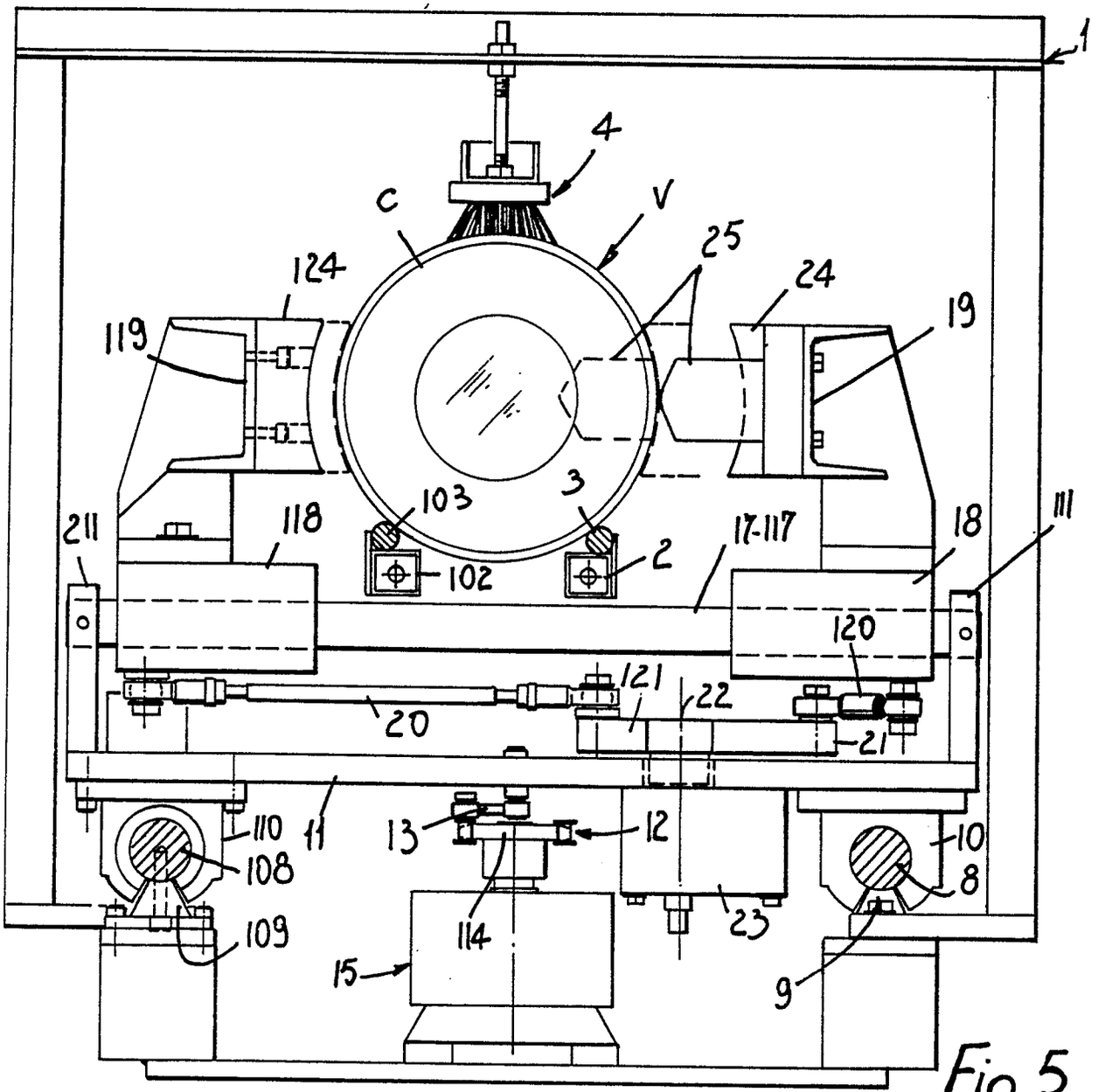
1
4
C
V
25
124
24
19
119
3
103
211
118
17-117
18
111
102
2
120
121
22
20
21
110
11
13
12
10
108
8
109
114
23
15
9

Fig. 5
C

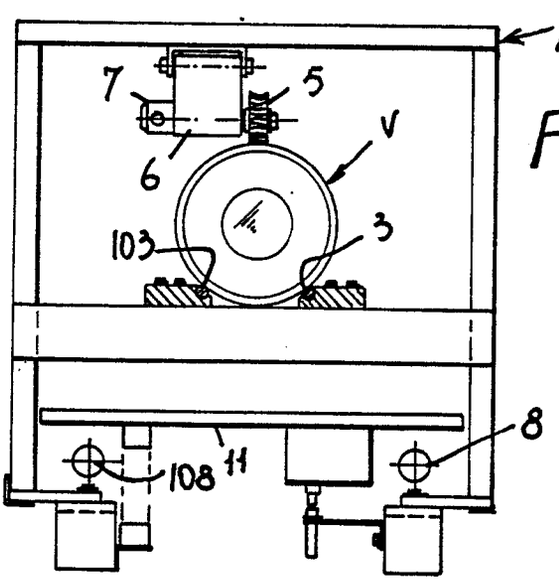
1
7
5
V
6
3
103
8
108
11

Fig. 6
C

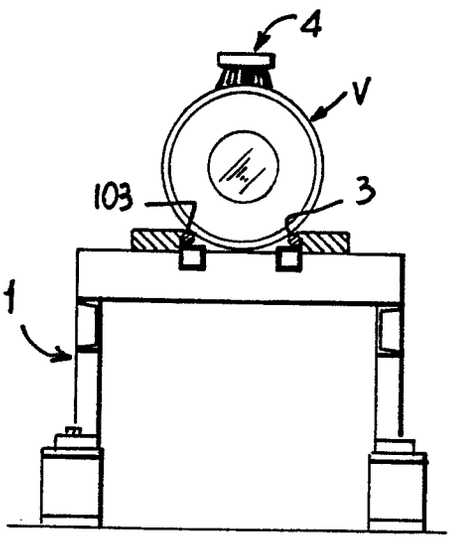
4
V
103
3
1

Fig. 7

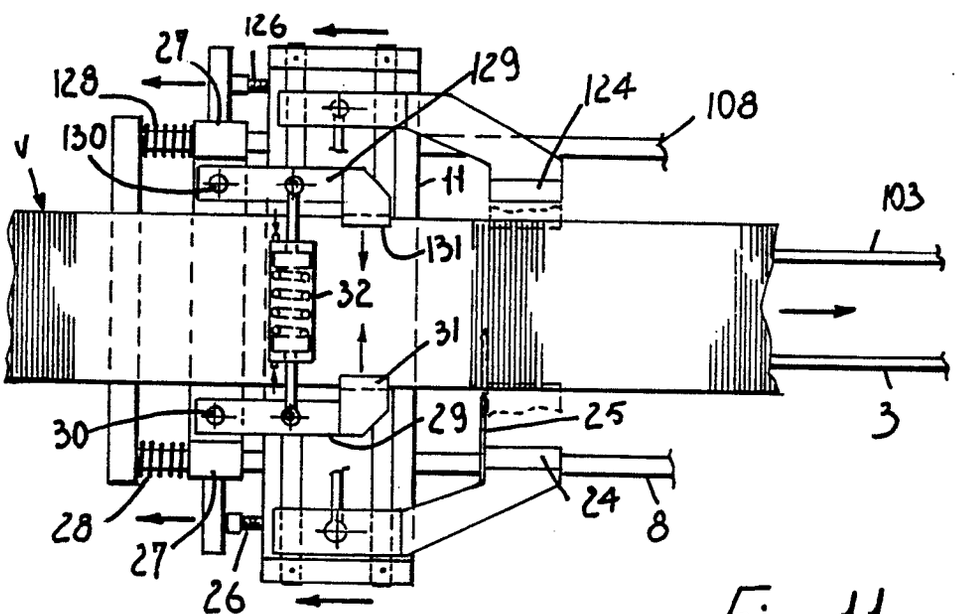
126
27
128
129
124
108
130
V
11
103
131
32
31
30
29
25
3
28
27
26
24
8

Fig. 11

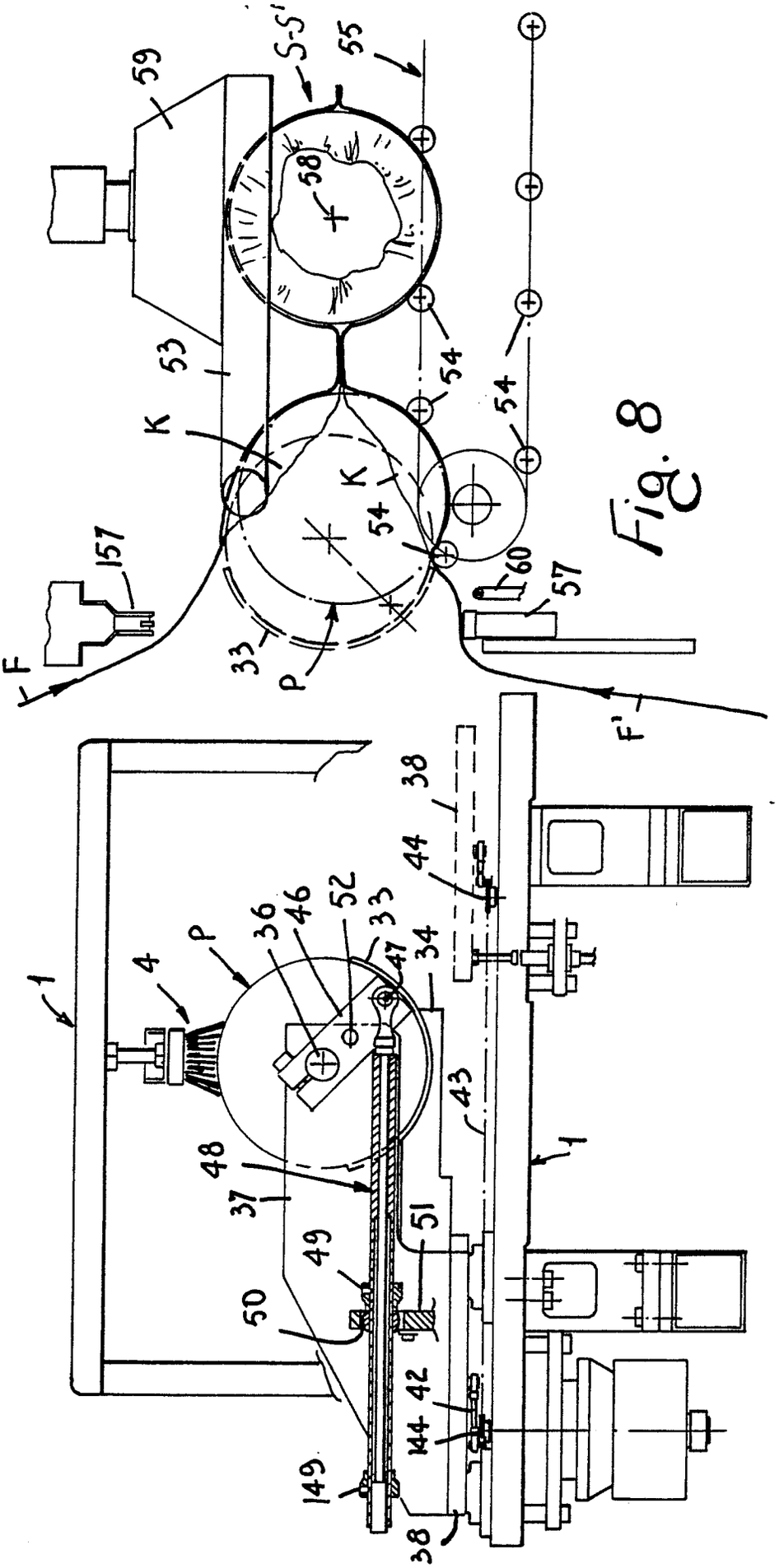
59
S-S'
55
58
53
54
54
K
K
54
157
F
33
P
60
57
F'
38
44
52
46
36
33
34
47
P
4
1
43
48
37
51
49
50
42
44
149
38

Fig. 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 10 1825

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.4)
A	DE-A-3 222 562 (E. PESTER) * Page 11, line 12 - page 16, line 12; figures *	1,4	B 65 B 9/02 B 65 B 53/06
A	GB-A-2 092 984 (ELSNER ENG. WORKS) * Page 2, lines 37-73; figures 1-3 *	1,4	
A	LU-A- 57 089 (MILLIKEN) * Page 1, line 27 - page 2, line 12; figures *	1,4	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 65 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20-05-1988	JAGUSIAK A.H.G.

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, 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

EPO FORM 1503 03.82 (P0401)