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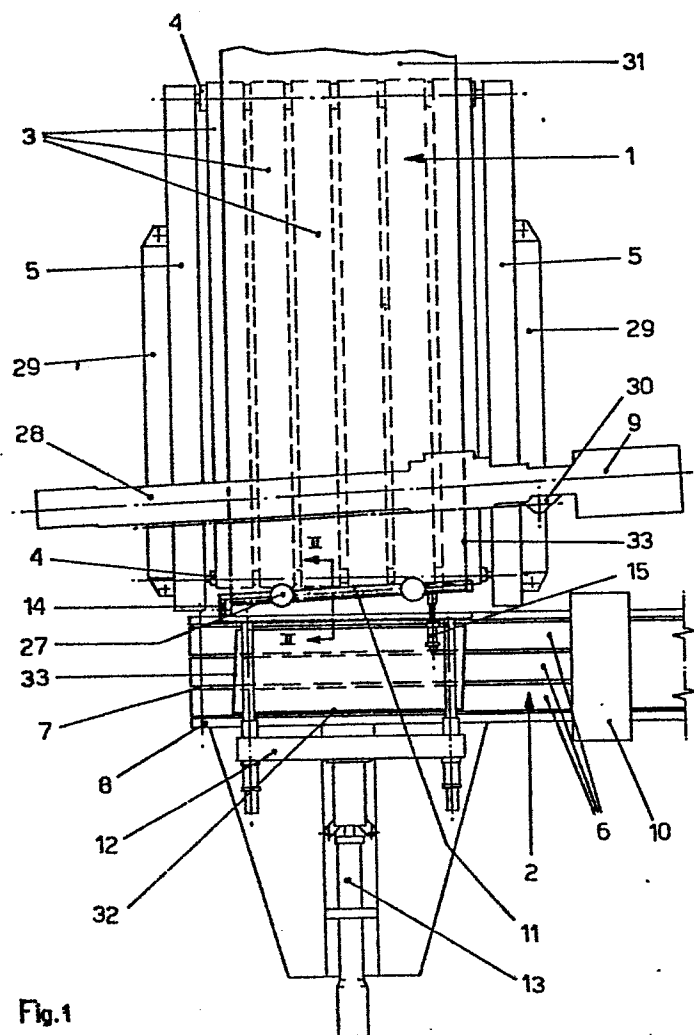
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(54) **Translator device for plants handling rubberized fabric strips.**

(57) *The translator-device*-that, in particular, is applied to a plant for producing rubberized fabric-tapes which have their cords disposed transversally to the longitudinal direction of the tape itself; *takes* from a first device (1), strips (33) cut off from a piece of fabric, substantially in a perpendicular direction to that of the reinforcing cords *and*, through the means of a grasping device (11) provided with needles (24), apt for opposing any friction between the rubberized fabric-strips and the supporting surfaces for these strips, and also capable of ensuring a correct pre-determined orientation of the strips, *transfers* the strips to a second device (2) having an orthogonal advancing direction with respect to that of the first device, whereon the strips are jointed together – along their borders which are parallel to the inclination of the cords.



1 TRANSLATOR-DEVICE FOR PLANTS HANDLING RUBBERIZED-FABRIC
 STRIPS

Description

5 The present invention refers to a translator-device used in plants for handling rubberized fabrics and, more specifically for fabric-cord strips. For example the piecing-machines used for jointing the cord-fabric strips, are machines which
10 produce cord-fabric tapes having transversal cords, starting with cord-fabric pieces having cords parallel to the lateral edges of the piece. The machines in question, comprise a first motor-driven support - on which the cord-fabric strips are formed by cutting them off from a cord-fabric piece
15 having cords that are parallel to the lateral edges of the piece; as well as a second motor-driven support - downstream of the first one upon which - after being transferred from a translator-device, these strips are caused to advance, in the oblique direction with respect to the reinforcing cords,
20 towards a device that connects them, in series, to one another. As stated above, the passage of the fabric-cord strips - from the first to the second support, is carried-out through the means of a translator-device which - after having grasped each fabric strip that rests upon the first
25 motor-driven support, drags it over to the the second motor-driven support. The known translator-devices presently used in plants for handling fabrics - and, in particular, in piecing machines, make use, for the jointing of the fabric-strips, of a plurality of sucking-discs borne by a mobile
30 arm and connected to a pneumatic circuit.

 The sucking-discs are disposed on one edge of the fabric-strip. When they are depressurized, they result as being coupled with the fabric.

35 Once these operations are carried-out, the arm that bears the sucking-discs starts to shift and - in moving from the first to the second support, drags the fabric-strip along with it.

1 Once the arm bearing the sucking-discs has reached its pre-
established position, above the second motor-driven support,
the sucking-discs cease to be depressurized - and hence, by
releasing their hold of the fabric-strip, they leave it free
5 upon the second support.

At this point, the arm bearing the sucking-discs returns,
once more, to its starting position for grasping still an-
other rubberized-fabric strip - and for carrying-out with it
10 the previously described operations; whereas the fabric-
strip that has just been transferred onto the second motor-
driven support, is caused to advance from there till it
reaches a device for effectuating the jointing - between the
just-arrived strip and the end of the tape that is already
15 comprised in the jointed-strip.

However, the above-described known translator-devices are
the abode of numerous drawbacks.

20 First and foremost, the grasp that the sucking-discs manage
to hold on the edge of the fabric-strip is very insecure,
because of the inevitable surface irregularities of the
strip which can prevent having an efficient depressurizing -
and this renders the coupling between the bar bearing the
25 sucking-discs and the fabric-strip, to result as being quite
unreliable.

A second drawback consists of the poor precision in the
orientation of the fabric-strips on the second motor-driven
30 support, due to the friction encountered - while being
transferred from the first to the second support and the
scant effectiveness of the coupling ensured by the sucking-
discs, permitting relative slippings to occur between the
latter and the fabric-strips during their transferring.

35

A poor precision in orientation of the rubberized-fabric
strips on the second motor-driven support, causes a varia-
tion in the angle of the cords with respect to the longitu-

1 dinal direction of the tape to be produced - and hence, the
need for having a greater surmounting of the edges of the
strips themselves - as with respect to what is theoretically
5 required between the strips - during their reciprocal coupling.
This means that the tapes which are obtained through
the known piecing-machines result as having irregular characteristics
and non-uniform joints - i.e. with originating
drawbacks during their usage - for example, in the manufacture
of tyres and such-like.

10

A third drawback results from the fact of the sucking-discs
causing permanent undulations at the edges of the rubberized
fabric which they grip - since the elastomeric material of
the latter is non-vulcanized and hence, it is easily deform-
15 able in a permanent way.

In altering the flat configuration of the fabric-strip, the
undulations caused by the sucking-discs, can be the cause of
imprecisions had in the operations of jointing the diverse
20 strips, as carried-out on the second motor-driven support.

A final drawback is the slowness with which the transferring
is carried-out of the fabric-strip - from one motor-driven
support to the other. This slowness is owed to the fact that
25 for effectuating the depressurizing in the sucking-discs and
their successive pressurizing, it is necessary to place the
entire pneumatic circuit connected with them, under said
conditions.

30 The aim of the present invention is a translator-device that
obviates all the above-given drawbacks of the already known
devices, with also conferring a greater reliability to the
plants that handle fabrics - where said translator-device
is used, and also to the products obtained with them.

35

What forms the object of the present invention is a translator-device
for plants that handle rubberized fabrics, which is apt for transferring
the said fabrics from a first

1 to a second support, the said translator-device comprising
a mobile arm - mounted on a plane above the two supports and
provided with removable grasping-means, that is disposed at
one edge of said fabric, characterized by the fact that said
5 removable grasping-means comprise:

- a plurality of needles, parallel to each other and exiting
from the arm and being apt for piercing said rubberized-
fabric edge;
- 10 - an actioning means for the needles, for conferring to them
an alternating movement - in the direction substantially
perpendicular to the plane upon which the arm shifts.

The present invention will be better understood from the
15 following detailed description - made solely by way of non-
limiting example, with referring made to the figures of the
attached drawing sheets, wherein:

FIG. 1 - shows a plan-view of a translator-device according
20 to the invention, applied to a piecing-machine for
rubberized fabric-strips;

FIG. 2 - shows a large-scale view of a detail of the trans-
lator-device according to the invention;

25 FIGS. - 4a, 4b and 4c - show the configuration assumed by
the detail shown in FIG. 3, during the functioning
of the translator-device

30 In FIG. 1, the translator device according to the invention
is shown, as applied to a plant for producing and recipro-
cally jointing rubberized-fabric strips - and more precise-
ly, cord-fabric strips.

35 As can be seen in FIG. 1, the plant comprises a first motor-
driven support 1 and a second motor-driven support 2. The
working-surfaces of the motor-driven supports 1 and 2 are
coplanar. The motor-driven support 1 is comprised by a plu-

1 rality of conveyor-belts 3 that are parallel to one another
and mounted between two rollers 4 supported by a casing 5.

Similarly, the motor-driven support 2 is formed by a plu-
5 rality of conveyor-belts 6 mounted between two rollers 7 -
(only one is shown in FIG. 1) that, in their turn, are sup-
ported by a framework 8.

Moreover, connected to the first motor-driven support 1,
10 there is present a cutting-device 9 (whose details will be
described further on in the text) and, on the motor-driven
support 2 there is present a per se known device 10, through
which the jointing is carried-out between the various strips
of rubberized-fabric.

15 A translator-device, according to the invention, is inter-
posed between the motor-driven supports 1 and 2.

The translator-device according to the invention, comprises
20 an arm 11 - whose details (that will be described further on
in the text) are shown in FIG. 3, supported upon a casing 12
to which there is connected a cylinder-piston system 13 that
is apt for imparting to the casing - and to the arm 11 sup-
ported by it, an alternating motion in a plane parallel to
25 the common plane where lie the working-surfaces of the motor
driven supports 1 and 2.

The arm 11 is hinged - at its extremity 14, to the casing 12
and, in an intermediate position, said arm 11 is fixed to
30 said casing 12 by a cylinder-piston system 15 - which is apt
both, for imparting an alternating oscillatory motion to the
arm 11 - with respect to the extremity 14, as well as for
adjusting the inclination of the arm 11 - with respect to
the casing 12.

35 For the purpose of favouring the grasping of the fabric-
strip - by the translator-device of the invention, the plant
moreover, comprises a slab 16 (seen in FIG. 2) underlying

1 the arm 11 and interposed in the space between the first and
the second motor-driven supports.

In particular, the surface 17 of slab 16, is coplanar with
5 the working-surfaces of the motor-driven supports 1 and 2
and inside them are present grooves 18 - whose function will
be described further on in the text.

As stated previously, the arm 11 has a structure (as seen
10 in FIG. 3) that will be described herebelow.

The arm 11 comprises a U-section structural-shape 19 - that,
in correspondence of its own base 20, is provided with a
plurality of holes 21 which are aligned one with the other.

15 In the U-section structural-shape 19 is housed a rigid rod
22 - that bears on its surface a plurality of needles 24,
which engage with the holes 21 of the U-section structural-
shape 19.

20 At the extremities of the wings 21 of the U-section struc-
tural-shape 19 there is anchored a lid 26 - which shuts the
hollow cavity of the U-section structural-shape 19 and also
supports the cylinder-piston systems 27. The cylinder-piston
25 systems 27 are rigidly connected to the rod 22 and impart
to the latter an alternating motion, with three stopping-
positions, guided by the wings of the U-section structural-
shape 19.

30 In particular, it must be noted that, at one of the said
stopping-positions, the needles 24 of the translator-device
are housed in the characteristic above-described cavities 18
- which are present in the slab 16 (see FIG. 2).

35 As previously stated, to the first motor-driven support 1,
there are connected the cutting-means 9.

1 The cutting-means 9, comprise a blade, that is transversally
slidable in a casing 28 disposed transversally to the motor-
driven support 1.

5 In its turn, the casing 28 is supported by a framework 29 -
which is shiftable along the casing 5 of the first motor-
driven support - and with removable means being foreseen
between the framework and the casing. Moreover, the casing
28 is hinged at 30 to the framework 29 - and means for
10 blocking the hinging 30, are provided.

The translator-device and the piecing-machine - for the
rubberized-fabric strips, to which it is applied, are more-
over, provided with means of the per se known type, for co-
15 ordinating the movements of the various mechanisms compris-
ing them - and which hence, will not be described here, as
anyone skilled in the art is quite able to determine them
from the description given herebelow, of the functioning of
the device according to the invention.

20 Prior to putting the plant into operation, the width is pre-
established of the fabric-cord tape that must be produced
and the inclination which the transversal cords must have
in said tape - with respect to the edges of the tape itself.

25 On the basis of this characteristic, provision is made for
imparting to the casing 28 bearing the cutting-means, the
necessary inclination - through causing it to rotate about
the hinge 30 and then blocking the latter.

30 Moreover, provision is also made for moving the framework 29
along the casing 5 of the first motor-driven support for -
in this way, determining that the longitudinal dimensions of
the rubberized-fabric strips, which are formed on the motor-
35 driven support 1, are equal to the width of the tape that
has to be produced.

1 A further preliminary adjustment, consists in disposing the
rod 11 - of the translator-device, parallelly to the casing
28 and with causing it to rotate about the hinge 14 present
at its extremity, through an adjustment in the length of the
5 cylindrical-piston system 15.

Once these preliminary adjustments have been effectuated and
after the pre-established inclination has been conferred to
the edge of the fabric-cord piece 31 - present on the motor-
10 driven support 1, in such a manner as to equal that of the
rod 11, through the cutting-device incorporated in the cas-
ing 28, thereafter the machine starts to operate.

The motor-driven support 1 starts operating and, in parti-
15 cular, it puts into motion the conveyor-belts 3 that com-
prise it - with thus causing the rubberized-fabric piece 31
to advance till it takes the edge 32 into the slab 16 (FIG.
4a) underlying the rod 11 of the translator-device.

20 When the edge 32 has reached this position - as signaled,
for example, by a photo-electric cell, the device 9 causes
the piece 31' to be cut - with thus originating a fabric-
strip 33 (shown with a dot-and-dash line in FIG. 1) and,
after this, the translator-device starts operating. The
25 first operation carried-out by the translator-device is to
grasp the edge 32 of the fabric-strip 33 that is found
under the arm 11.

For this operation, the cylinder-piston system 27 comes in-
30 to function through the arm 11 - which causes the needles 24
to exit from the U-section structural-shape 19 and to pierce
the edge of the fabric-strip 33 to be finally housed in the
opening 18 of slab 16.

35 The lay-out assumed by the arm 11 - with respect to the
fabric-strip, is shown in FIG. 4a.

1 At this point the cylinder-piston systems 27 come into func-
tion once again, and provide for making the needles 32 to
partially re-enter inside the U-section structural-shape 19 -
with thus causing the edge 32 of the rubberized fabric-strip
5 33 to become raised because of its adhering to the needles
through friction, with making it assume the lay out shown in
FIG. 4b.

Once the strip-edge has attained the above-said configura-
10 tion, the cylinder-piston system 13 starts to function, with
causing the transferring of the arm 11 - and so also the
cylinder-piston system 15, with causing a rotation of said
arm 11 about its own extremity 14.

15 As a result of the actioning of the above-said cylinder-
piston systems, a transferring of the fabric-strip 33 and a
rotation of the same is had, which moves it (shown with a
full-line) onto the second motor-driven support 2 - and
provision is made for disposing the edge 32 parallelly to
20 the borders of said motor-driven support 2.

When the edge 32 of the fabric-strip 33 reaches the defined
position - that it must assume upon the second motor-driven
support 2, these cylinder-piston devices 27 start function-
25 ing again - with causing the needles 24 to go back into the
U-section structural-shape 19. Owing to this operation, the
edge of the fabric-strip 33 interferes with the structural-
shape 19 - and hence, through being freed from its engage-
ment with the needles 24, it becomes disposed (as shown in
30 FIG. 4c) in contact with the motor-driven support 2.

At the end of the above-said operations, the motive means
(not shown) of the first and the second supports, start
functioning - with having the following described results.

35

The rubberized fabric-strip which the translator-device has
disposed on the second motor-driven support 2, is shifted
upon it towards the device 10 - that will provide for the

1 jointing of this rubberized fabric-strip to the other, previously joined strips - for, in this way, originating a rubberized-fabric tape containing transversal cords.

5 In the meanwhile, the first motor-driven support 1, causes the rubberized fabric piece 31 to advance once more - for originating another rubberized fabric-strip 33.

Simultaneously to the above-described operations which are
10 carried-out by the motor-driven supports, the cylinder-piston systems 13 and 15 begin to operate once again - with causing the arm 11 to return to its starting position.

At this point, a new machine cycle begins, which will repeat
15 the above-described operations.

From the above-given description of a device - according to the present invention and its functioning, it can be understood how the proposed aims can be achieved through them.

20 In the first place, because of the fact that the translator-device - according to the present invention, is apt for grasping the strips by means of the needles - that cause a perforation in the edge of these strips, there is guaranteed
25 a sure fixing between said elements - which is not at all influenceable by the frictions that are encountered by the strips when taken from the first to the second support.

In this way there is obviated the possibility of any relative slippings taking place - between the arm that effectuates the transportation and the rubberized fabric-strip; moreover, no waviness is formed in the configuration of the strip edge.

30 In this way there is obviated the possibility of any relative slippings taking place - between the arm that effectuates the transportation and the rubberized fabric-strip; moreover, no waviness is formed in the configuration of the strip edge.

35 As a consequence of what has been stated above, there is had a considerable precision in the alignment of these rubberized fabric-strips on the second motor-driven support. This fact allows for reducing to the minimum, the thickness of the

1 overlapping - that has to take place between two diverse
strips of rubberized fabric, that are present on the motor-
driven support 2, in correspondence of the device 10 - where
the reciprocal jointing between the strips is effectuated
5 for having a tape with transversal cords.

Consequently, this signifies obtaining a rubberized fabric
tape having transversal cords which are all equally inclined
and practically devoid of any unevenness - and hence, apt
10 for guaranteeing the highest degree on a qualitative level
and a greater reliability of the products manufactured with
the tape itself.

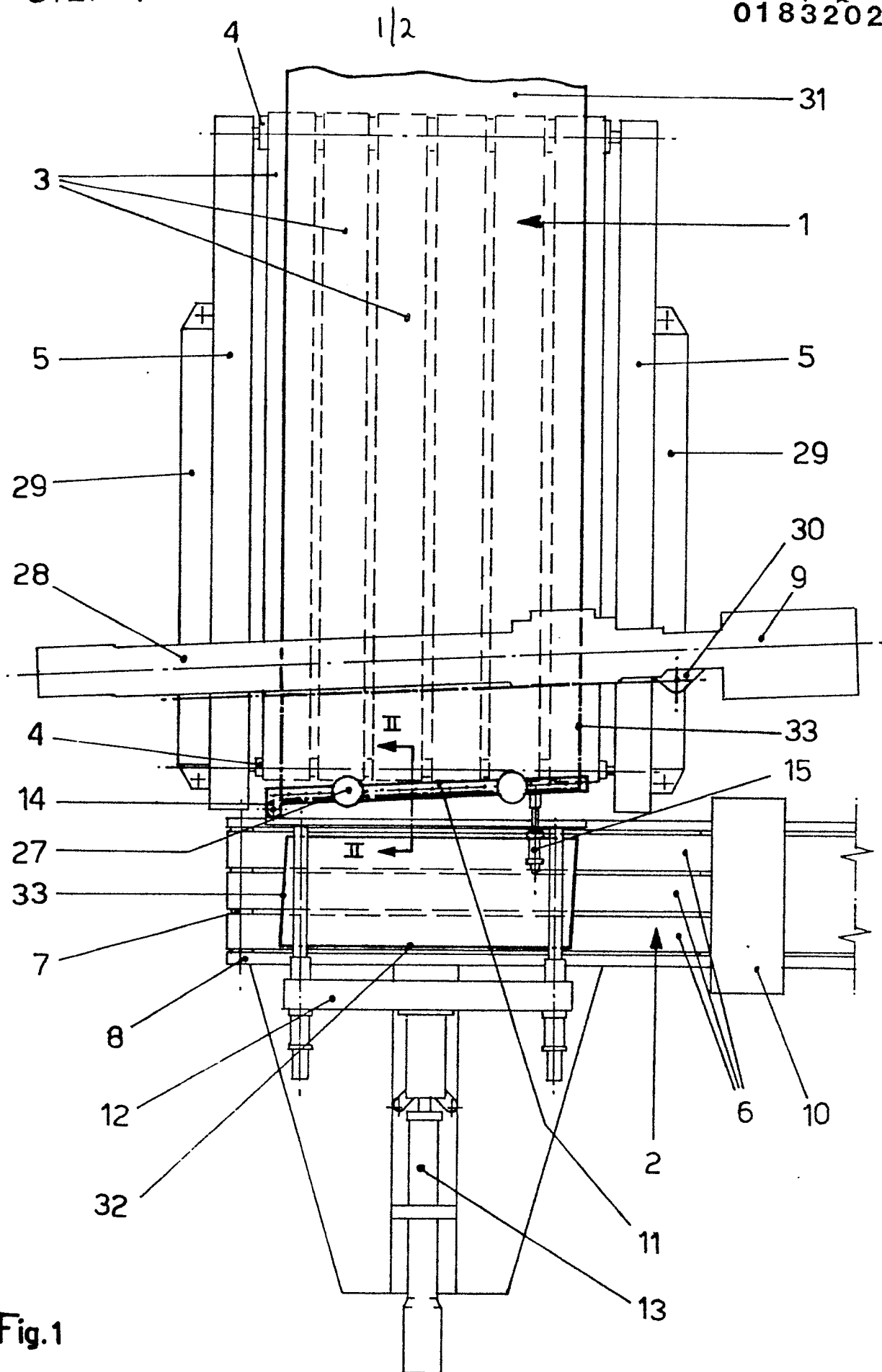
For the purpose of clarity, this translator-device according
15 to the invention, has been described in connection with a
plant for the production and the jointing of rubberized
fabric-strips - with only pointing out, through referring to
a practical case, all its constructive and functioning cha-
racteristics. However, it also results as being clear that
20 said translator-device has absolutely not to be taken as
limited to this specific plant, but that it can also be used
in any other whatsoever plants handling rubberized fabrics -
such as, for example, in devices used for feeding the semi-
finished fabrics to the building-drums for tyre carcasses.

25 Although a particular form of embodiment, according to the
present invention, has been illustrated and described here,
what is also intended as being comprised within the scope of
this invention are all those possible alternative variations
30 that are accessible to one skilled in the art.

35

1 C L A I M S

1. Translator-device for plants that handle rubberized fabrics, which is apt for transferring the said fabrics from
5 a first to a second support, the said translator-device comprising a mobile arm (11) mounted on a plane above the two supports, provided with removable grasping-means, disposed at one edge of said fabric, characterized by the fact that these said removable grasping-means comprise:
- 10 - a plurality of needles (24), parallel to each other and exiting from the arm and with being apt for piercing said rubberized-fabric edge;
- 15 - an actioning-means (27) for the needles, for conferring to them an alternating movement in the direction substantially perpendicular to the plane upon which the arm shifts.
2. Device, according to CLAIM 1, characterized by the fact that the arm comprises:
- 20 - a U-section structural-shape (19) in whose central core there are present a plurality of aligned holes (21);
- 25 - a rigid rod (22) housed in the U-section structural-shape (19), from which there depart a plurality of parallel and adjacent needles (24), which are slidable inside the holes of the U-section structural shape;
- 30 - a mechanism (27) which imparts an alternating movement to the rigid rod (22) inside the U-section structural-shape, parallelly to its wings, with there being three stopping-positions for the needles.
- 35 3. Device, according to CLAIM 1, characterized by the fact that, in a plane overlying the two supports and parallel to their working-surfaces, the mobile arm (11) is supported by a mobile casing (12), with having one extremity hinged to the latter and also having a mechanism (15), provided, in an intermediate position to the arm, which simultaneously allows for adjusting both, the inclination of the arm itself on the casing, as well as a rotation of the arm about one of its extremities.



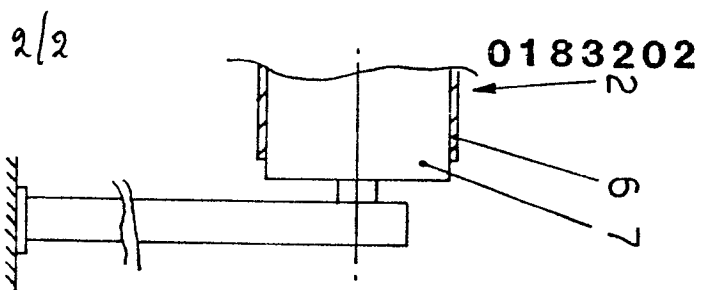


Fig. 2

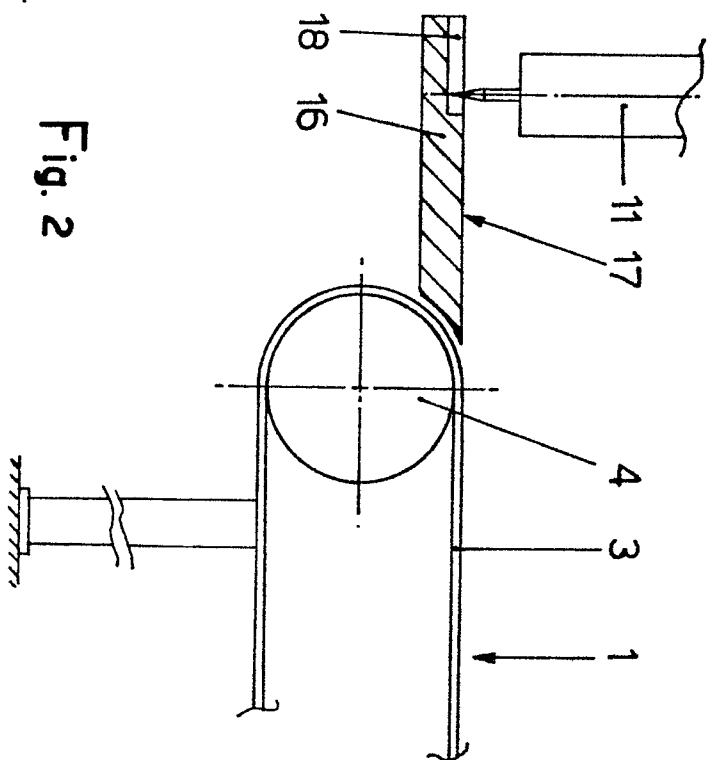


Fig. 3

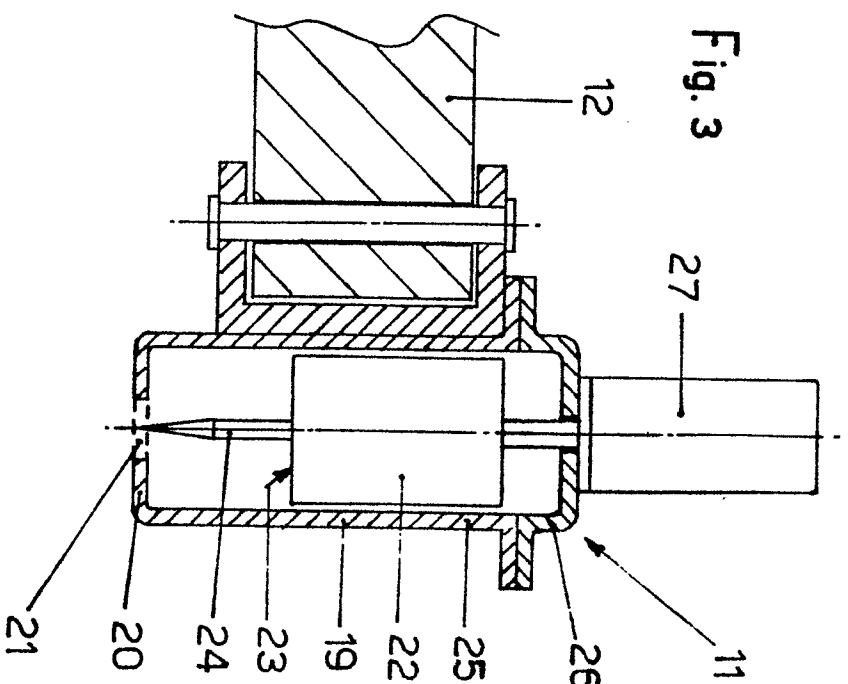


Fig. 4a

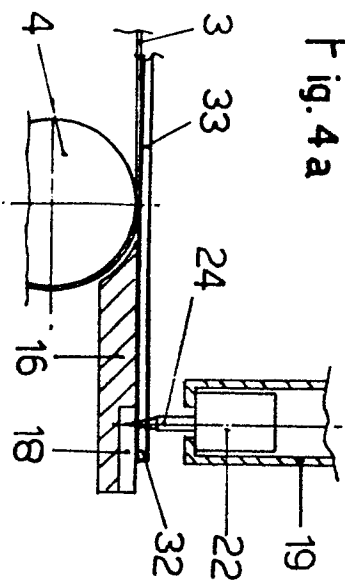


Fig. 4b

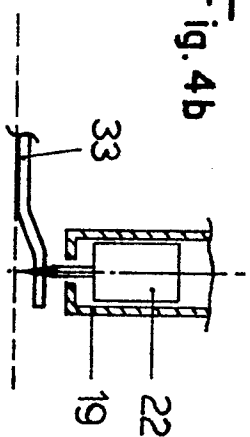
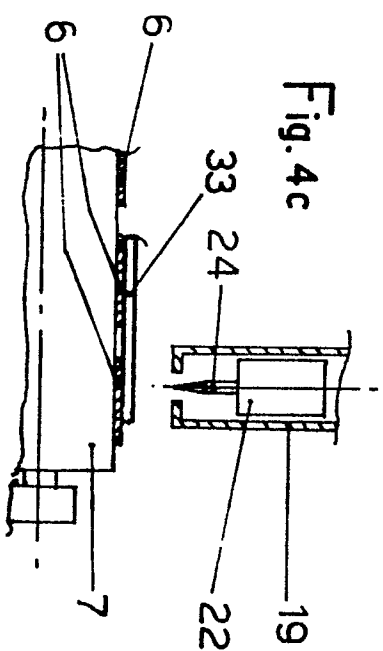


Fig. 4c





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)
X	PATENT ABSTRACTS OF JAPAN, vol. 8, no. 40 (M-278)[1477], 21th February 1984; & JP - A - 58 197 139 (YOKOHAMA GOMU K.K.) 16-11-1983	1	B 65 H 5/16
A	IDEM	2,3	
X	--- DE-A-2 839 257 (CLUETT, PEABODY & CO.) * claim 1; figures 2-10 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4) B 65 H 3/00 B 65 H 5/00 B 65 H 29/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 12-02-1986	Examiner FUCHS H.X.J.
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			