

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **85107824.6**

(51) Int. Cl.⁴: **B 65 H 1/18**
B 65 H 23/032

(22) Date of filing: **24.06.85**

(30) Priority: **10.07.84 IT 1255984**

(43) Date of publication of application:
15.01.86 Bulletin 86/3

(84) Designated Contracting States:
CH DE FR GB LI NL SE

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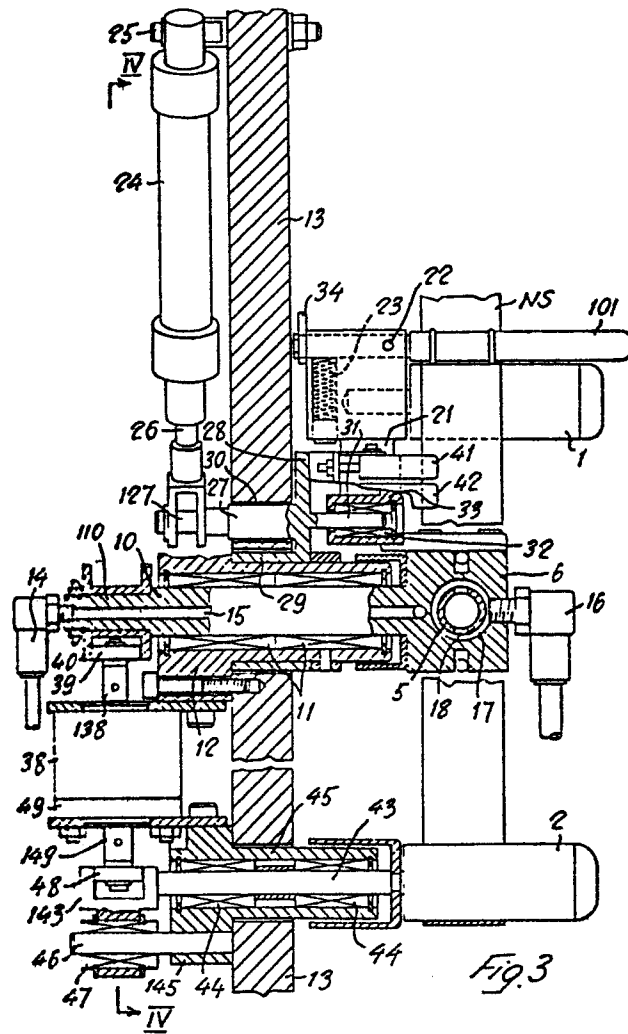
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(54) Splicing device for webs, particularly for paper webs for cigarettes.

(57) The invention relates to a device for the splicing of paper webs, for example wrapping paper webs, for example paper webs for cigarettes, more particularly for the splicing of the web (NS) coming from a depleted bobbin to the leading end of the web (NR) coming from a standby or reserve bobbin, particularly under stationary conditions of the webs (NS, NR). The device according to the invention is characterized by transversal alignment shifting means (38) of the web (NS) coming from a depleted bobbin and/or of the leading end of the web (NR) of the standby bobbin, which shifting takes place in the direction of the width of the webs. Said transversal alignment means (38) are automatically controlled by sensors (41, 42) which are sensible to the transversal position of either one or both webs (NS, NR) with respect to a predetermined correct mutual alignment position before the splicing.

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1 SASIB S.p.A., Bologna, Italy.

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10 " Splicing device for webs, particularly for paper webs for cigarettes "

15 The present invention relates to devices for the splicing of webs, for example wrapping material webs and particularly paper webs for cigarettes, for the splicing of the web coming from a depleted bobbin to the leading end of the web coming from a standby or reserve bobbin. More
20 particularly the invention relates to devices of this type which effect the splicing under stationary conditions of the webs, i.e. by holding stationary the web from the depleted bobbin, after having formed with this web a
25 sufficient reserve in a buffer magazine provided downstream of the splicing device, so as to guarantee the continuous operation of the machine fed with the web.

30 In the known devices of this type, when the web unwound from the depleted bobbin is stopped to carry out

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1 the splicing, its median longitudinal axis results to
be frequently offset, due to the unavoidable side skids,
with respect to the median longitudinal axis of the leading
end of the web from the standby bobbin. As a consequence,
5 the splicing is not perfect, since the two webs are
superposed in a defective manner, i.e. one web is offset
with respect to the other in the direction of the width
which disturbs the regular operation of the machine being
fed.

10

The invention has the scope of avoiding this
inconvenience and guarantees a perfect alignment of the
median longitudinal axis of webs when effecting the
splicing of webs. For this purpose the invention includes
15 shifting means for the transversal alignment of the web
coming from a depleted bobbin and/or the leading end of a
web coming from the standby bobbin, in the direction of
the width of the webs, said shifting means being
automatically controlled by sensors which are sensible
20 to the transversal position of either one or both webs
with respect to a predetermined correct mutual alignment
position and being capable of bringing one or both webs
into correct mutual alignment position before the splicing.

25

The invention is independent with respect to the
splicing system of the two webs and can be applied to
any splicing device of the above described type.
Particularly the invention includes a splicing device of
the above mentioned type characterized by two opposite
30 splicing heads provided with two movable suction pressers

which
1 and can be angularly shifted between a rest position, at
which onto a suction presser of one splicing head is
applied and is held the leading end of the web from the
standby bobbin, and a working position at which the
5 pressers of the two splicing heads are facingly arranged
on opposed sides of the depleted bobbin and are moved
one towards the other so as to press the depleted bobbin
web against the leading end of the web of the standby
bobbin with the interposition of an adhesive label, one
10 or both splicing heads being mounted transversally
slidable with respect to the relevant webs in the
direction of the width of the webs and under the action
of the said alignment means for the transversal alignment
shifting.

15 Those and other characteristic features of the
invention and its advantages will appear evident from
the following description of an embodiment shown as a
non-restrictive example in the attached drawings in which:

20 Figures 1 and 2 show in elevation, with parts in
section, a splicing device according to the invention,
before and during splicing of the two webs.

25 Figure 3 shows a vertical cross section according to
line III-III of figure 1.

Figure 4 shows a cross sectional view according to
line IV-IV of figure 3.

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1 Figure 5 shows an elevation view in an enlarged
scale of the detail of sensor means which act in
response to the web transversal position.

5 Figure 6 shows the blade cutting the depleted
bobbin web tail, after splicing to the standby bobbin
web.

 With reference to the figures, reference letters
10 NS indicate a web of wrapping material, in particular a
cigarette paper web, coming from a bobbin (not shown)
and fed, in the direction of arrow F of figure 1, to a
machine, for example a machine for cigarette wrapping
(not shown).

15 The web NS being unwound passes through a roller 1
and around a roller 2. In the embodiment shown the
portion of web NS between rollers 1 and 2 is substantially
vertical but it may have any other direction. NR indicates
20 a similar web coming from a standby bobbin (not shown).
The leading end of the standby web NR is connected to the
tail of pay-off web NS when the bobbin of web NS is
depleted.

25 The device for splicing webs NS and NR includes two
splicing heads GS and GR located on opposed sides of the
path of web NS between roller 1 upstream and roller 2
downstream the splicing head GS. Splicing head GR is
associated to an upstream roller 3 for web NR. The two
30 splicing heads GS and GR are identical and alternately

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1 work in the same way. Consequently a description of
splicing head GS only will follow, including the parts
associated to it and the same reference numbers will
indicate also the elements of the other splicing head
5 GR and the parts associated thereto.

Each splicing head GS and GR is formed by a
suction presser 4 integral with piston 5 of a simple
action pneumatic cylinder equipped with spring return 7.
10 This means that the suction presser 4 is pulled
forward by the compressed air of cylinder 6 while a
pressure spring 7 interposed between the body of
cylinder 6 and a rear extension 9 of piston 5 keeps
back this latter together with suction presser 7 when
15 the pneumatic pressure in cylinder 6 stops.
Cylinder 6 is mounted in overhanging manner onto a
transversal pivot 10 revolving and axially sliding by
means of ball sleeves 11 in a tube 12 connected to a
supporting plate 13.

20 Compressed air is supplied to chamber 20 of
cylinder 6 mounted on the back side of piston 5 by
connection 14 and a longitudinal slot 15 in pivot 10.
Suction is instead applied by connection 16 and by an
25 annular chamber 17 located on the upper side of piston 5
and connected, by means of radial holes 18, to a
chamber 19 mounted behind the flat head provided with
holes of presser 4.

30 Cylinder 6 of each splicing head GS, GR is provided

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1 with an arm 21 bringing the relevant roller 1, 3 of web
NS, NR and its respective web-pinching finger 101, 103.
Web NS coming from its bobbin passes through roller 1
and respective web-pinching finger 101, while web NR
5 from the standby bobbin is passed between roller 3 and
web-pinching finger 103. Each web-pinching finger 101,
103 is assembled on a pivot 22 and swinging on the
respective support integral with arm 21 and is pulled
by a spring 23 towards its corresponding roller 1,3.
10 Due to spring 23 each web-pinching finger 101, 103 can
have a locking position in which it locks the respective
web NS, NR on the corresponding roller 1, 3.

Thanks to the above described embodiment, each
15 splicing head GS, GR swings, together with roller 1, 3
and respective web-pinching finger 101, 103, around a
transversal axis formed by pivot 10, and moves with pivot
10 along the above said axis and transversally to the
relevant plane of web NS, NR, that is in the direction
20 of the width of the web itself.

A pneumatic cylinder 24 provides for the angular
movement of each splicing head GS, GR i.e. of the
respective cylinder 6 around the transversal pivot 10,
25 the cylinder being mounted swinging on pivot 25 to supporting
plate 13 while its shaft 26 is fitted to the end 127 of a
pivot 27 integral to arm 28 of a sleeve 29 assembled and
revolving around tube 12 coaxially to pivot 10.

30 Pivot 27 slides through a curved slot 30 located in

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1 the supporting plate 13 coaxially to pivot 10. Coaxially
to pivot 27, arm 28 of revolving sleeve 29 is provided
with a dragging pin 31 which engages in rotatable manner
and slides longitudinally by means of a ball sleeve 32
5 in a cylindrical housing over arm 21 of cylinder 6.

Under the action of actuator cylinder 24 each
splicing head GS, GR can be angularly shifted around the
axis of the respective transversal pivot 10 and together
10 with pivot 10 so as to reach alternately an angular
working position in which the face of suction presser 4
is substantially parallel to web NS of the pay-off
bobbin, passed around roller 2 downstream and fed to the
user machine as shown for splicing head GS, and an
15 angular rest position in which the face of suction
presser 4 is inclined outwardly with respect to the path
of the web NS being unrolled and is, for example, facing
upwardly as shown for splicing head GR.

20 Splicing of webs NS and NR is carried out as
follows:
Splicing head GS of web NS of the pay-off bobbin is in
the above mentioned angular working position and suction
through its presser 4 is interrupted. An extension 34 of
25 web pinching finger 101 cooperating with roller 1 of
splicing head GS touches, in this working position of
splicing head GS, an adjustable screw 35 that causes
web-pinching finger 101 swinging on fulcrum 22 lifting it -
by the action of spring 23, from its respective roller 1.

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1 Web NS of the bobbin being unrolled passes freely
between roller 1 and its respective lifted web-pinching
finger 101 as shown in figure 1. Splicing head GR
connected to web NR of the standby bobbin is in the
5 above described angular rest position and suction, through
presser 4, is carried out. The leading end of web NR of
the standby bobbin is provided with an label L adhesive
on both sides and is applied to suction presser 4 which
holds it by sucking.

10

 In the meanwhile web NR is blocked on roller 3 by
its respective web pinching finger 103 pressed against
roller 3 by spring 23. When the pay-off bobbin is
depleting, a sufficient reserve of web NS is provided by
15 a buffer magazine located downstream the splicing device
and the running of web NS is stopped upstream the said
buffer magazine. Subsequently, when the web is in a
stationary position, splicing head GR is driven in its
angular working position as shown in figure 2. During this
20 angular movement of splicing head GR, web NR is pulled
and comes from its respective standby bobbin, being
blocked by the web-pinching finger 103 on the movable
roller 3 together with splicing head GR. A little before
splicing, head GR reaches its working position shown in
25 figure 1, extension 34 of web-pinching finger 103 cooperating
with roller 3 touches screw 35 and lifts roller 3 which
frees web NR.

 In working position of both splicing heads GS and
30 GR, pressers 4 are facing and opposed to the interposed

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1 webs NS and NR. Compressed air is fed to chamber 20 of
cylinder 6 of splicing head GS and presser 4 of this
head is pushed against the presser of the opposite head
GR, thus connecting the leading end of web NR to web
5 NS by the interposed adhesive label L.

During the forward movement of presser 4 of
splicing head GS, the presser causes the cutting of
the end of web NS by a fixed blade 36 located between
10 the two splicing heads GS and GR on a stationary support,
the edges of which are facing the splicing heads GS and
GR and are saw-shaped as shown in detail by figures 1,
2 and 6. After splicing of webs NS, NR, suction is
stopped by presser 4 of splicing head GR that remains in
15 its angular working position while the splicing head GS
is brought in its angular rest position similar to that
shown in figure 1 of splicing head GR, to receive the
leading end of the web of a new standby bobbin which
replaces the depleted bobbin.

20

The next splicing operation is carried out as above
explained with inverted functions of the two splicing
heads. The possibility of a rectilinear shifting of the
splicing heads GS and GR together with the corresponding
25 roller 1, 3 of the respective web-pinching finger 101,
103 axially to pivot 10 and in the direction of the width
of webs NS, NR serves to guarantee the mutual alignment
of web NS, NR to be spliced. The above mentioned
rectilinear shifting of each splicing head GS, GR is
30 obtained by a stepping electric motor 38 moving a roller 39

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1 eccentrically pivoted to shaft 138 of motor 38 and
connected to the peripheral ring slot of a dragging
collar 40 which is mounted freely revolving but not
axially sliding on the bottom end 110 of pivot 10.

5

By shifting roller 39 with the relevant stepping
motor 38, collar 40 drags and axially shifts, in one
direction or the other, pivot 10 together with cylinder
6 and arm 21 carrying the associated roller 1 or 3
10 and the respective web-pinching finger 101, 103.
Axial shifting of each roller 1, 3 causes the
corresponding shifting of the respective web NS, NR
in the direction of the width as web NS, NR is
friction dragged by roller 1, 3 also when it is not
15 blocked on it by the respective web-pinching finger
101, 103. During its rectilinear movement in a
direction axial to pivot 10, cylinder 6 of each
splicing head GS, GR is operatively coupled to its
respective actuator cylinder for its angular shifting
20 due to the axially sliding assembly of dragging pin 31
in its relevant cylindrical housing 33 on arm 21.
Direction and amplitude of movement of each stepping
motor 38 are controlled by a sensor associated to each
splicing head GS, GR and sensible to the transversal
25 position of relevant webs NS, NR with respect to a
pre-set transversal position of perfect mutual
alignment of the two webs NS, NR.

In the embodiment shown this sensor is formed by two
30 fork photocells 41, 42 which are assembled on the arm 28

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1 of the revolving sleeve 29 on the fixed tube 12 of pivot
10 and are placed one after the other in the longitudinal
direction of respective web NS, NR. One arm of the fork
of each photocell 41, 42 is equipped with a light emitter,
5 while the other arm of the fork, facing the light emitter,
is equipped with its respective photosensible receiver.
Web NS, NR associated to each splicing head GS, GR
passes with its edge through the two subsequent fork
photocells 41, 42. The two fork photocells 41, 42 are
10 slightly off-set one with respect to the other in the
direction of the width of web NS, NR. When web NS, NR
associated to a splicing head GS, GR and with respect to
presser 4 of this head is in a correct position and
guarantees superposing with perfect alignment to web NR,
15 NS associated to the other splicing head GS, GR, its edge
passes between the two fork photocells 41, 42 and
intercepts the light flow between emitter and receiver of
one of these photocells (41), while keeping free the
light flow between emitter and receiver of the other
20 photocell 42 as shown in figure 5 for web NS.

In case that - after splicing head GS associated to
web NR of the standby bobbin shifts angularly from its
rest position (Figure 1) to its working position
25 (figure 2) to carry out splicing, and after lifting of
web-pinching finger 103 from its relevant roller 3, but
before splicing of the two webs NS, NR - one or both
the webs are not in their preset correct mutual alignment
position, that is if one and/or the other web NS, NR
30 intercept or allow the light flow between emitter and

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1 receiver of both photocells 41, 42 associated to their
relevant splicing head GS, GR, then the corresponding
stepping motor 38 receives a signal from the photocells
41, 42 and shifts cylinder 6 of splicing head GS, GR
5 and the respective roller 1, 3 together with web NS,
NR in the direction and measure necessary to intercept
or uncover the light flow between emitter and receiver
of one of the two associated photocells 41, 42. Thus
the two webs NS, NR are led to their correct mutual
10 alignment position in which the edge involved in its
respective couple of fork photocells 41, 42 is between
the light barriers mutually offset of these two
photocells. This guarantees automatically the perfect
alignment of the two webs NS, NR during splicing.

15
In order to obtain the above mentioned transversal
alignment shifting of web NR of the standby bobbin, it
is sufficient to effect the corresponding shifting of
cylinder 5 and roller 3 of the associated splicing
20 head GR which, in order to carry out splicing, moves
from its rest position according to figure 1, to its
working position according to figure 2. In fact the
leading end of web NR is held by sucking on presser 4
which moves together with roller 3, so the portion of
25 web NR included between roller 3 and suction presser 4
is not affected by the transversal alignment shifting of
splicing head GR.

Instead, the transversal alignment of splicing head
30 GS associated to web NS of the depleted bobbin would

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1 affect web NS with undesirable stresses in case roller 2,
located downstream the splicing head GS and around which
is passed web NS, is kept in its position.

5 In fact, in this case, the contact area of web NS with
upstream roller 1 would be transversally shifted, in the
direction of the width of web NS, together with cylinder
6 of splicing head GS, while the contact area of web NS
with the roller 2 downstream would remain motionless.

10 To avoid any consequent stress of web NS, the invention
includes an axial shifting of downstream roller 2 in
the direction of the width of the web together with
splicing head GS corresponding to the web NS of the
depleted bobbin, in the same direction and measure and
controlled by the couple of photocells 41, 42 associated
15 to splicing head GS.

For this purpose, as shown by figure 3, roller 2 is
rotatably mounted on pivot 43 supported and axially
sliding on ball sleeves 44 in a tube 45 assembled to the
20 supporting plate 13. The rear end 143 of pivot 43 is fork-
-shaped and is sliding, by means of ball sleeves 47, on a
pin 46 fixed to head 145 of tube 45. The fork end 143 of
pivot 43 is engaged by a small roller 48 eccentrically
pivoted to shaft 149 of a stepping motor 49, as shown by
25 figure 4. Stepping motor 49 effecting the axial shifting
of pivot 43 and roller 2 is controlled by a couple of
photocells 41, 42 of the splicing head being in the
working position and associated to the web of the
depleted bobbin, so as to shift roller 2 axially in the
30 same direction and measure of the said splicing head

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1 and consequently of the respective roller 1 or 3.

Obviously the invention is not restricted to the
above described embodiment, but it can be widely
5 changed and modified, mainly as far as construction is
concerned, without departing from the leading principle
as above described and claimed hereafter.

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1 CLAIMS

1. A splicing device for webs, for example wrapping
paper webs, particularly paper webs for cigarettes, for
5 splicing the web (NS) of a depleted bobbin to the leading
end of the web (NR) of a standby bobbin particularly
under stationary conditions of the said webs (NS, NR)
characterized by alignment means (38) for the
transversal alignment shifting of the web (NS) from
10 the depleted bobbin and/or the leading end of the web
(NR) from the standby bobbin, which shifting takes
place in the direction of the width of the webs, in
which said alignment means (38) are automatically
controlled by sensors (41, 42) which are sensible to
15 the transversal position of either one or both webs with
respect to a predetermined correct alignment position
and are capable of bringing one or both webs into
correct alignment position before the splicing.

20 2. A device according to Claim 1, characterized by
two opposed splicing heads (GS, GR) which are provided
with suction pressers (4) and can be angularly shifted
between a rest position, at which onto the suction
presser (4) on one splicing head (GR) there is applied
25 and is held the leading end of the web (NR) from the
standby bobbin, and a working position at which the pressers
(4) of the two splicing heads are facingly arranged on
opposed sides of the web (NS) of the depleted bobbin and
are moved one towards the other so as to press the web
30 (NS) of the depleted bobbin against the leading end of the

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1 web (NR) of the standby bobbin with the interposition
of an adhesive label (L), one or both splicing heads
(GS, GR) being mounted transversally slidable with
respect to their respective webs (NS, NR), in the
5 direction of the width of the webs and under the
action of alignment means (38) for the transversal
alignment shifting.

3. A device according to Claims 1 and 2, characterized
10 by the fact that each splicing head (GS, GR) carries up-
stream a roller (1, 3) onto which the respective web
(NS, NR) is passed, said rollers (1, 3) being shiftable
transversally together with the respective splicing heads
(GS, GR) in the direction of width of the webs (NS, NR)
15 and cooperating each with a respective movable web-
-pinching finger (101, 103).

4. A device according to Claims 1 to 3, characterized
by the fact that downstream of the two splicing heads
20 (GS, GR) there is arranged, in a stationary position,
a roller (2) onto which the web is passed, said roller
(2) being mounted axially shiftable in the direction
of the width of the web by means of shifting means
(49) which are controlled by the sensors (41, 42) of the
25 splicing head (GS) which is in the angular working
position and is associated to the web (NS) of the
depleted bobbin, so as to shift said roller (2) axially
in the same direction and of the same amount as the
respective splicing head (GS) and the roller located
30 (101) upstream of the splicing head.

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1 5. A device according any one or more of the preceding
Claims, characterized by the fact that the transversal
alignment shifting means of each splicing head (GS, GR)
and/or of roller (2) downstream of the splicing heads
5 consist of a stepping motor (38, 49) presenting a shaft
(138, 139) onto which there is eccentrically pivoted a
roller (39, 48) which is engaged in the recess of a fork-
-like portion (40, 143) of the pivot (10, 43) axially
shiftable which carries the splicing head (GS, GR) or the
10 roller (2) downstream of the splicing head.

 6. A device according to any one or more of the
preceding Claims, characterized by the fact that the
sensors (41, 42) associated to each splicing head (GS, GR)
15 consist of at least two subsequently arranged photocells
(41, 42), which are arranged at one edge of the web (NS,
NR) and are offset with respect to each other in the
direction of the width of the web, so that in the
correct transversal position of alignment of the web
20 (NS, NR) this latter covers one of the photocells (41)
and leaves the other uncovered (42).

 7. A device according to any one or more of the
preceding Claims characterized by the fact that in order
25 to promote the angular shifting of each splicing head
(GS, GR) there is provided a transmission device (28, 29)
which is mounted coaxially revolving with respect to the
splicing head (GS, GR) and is driven by an actuator
cylinder (24), the said transmission device (28, 29)
30 being provided with at least one driving pivot (31)

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1 parallel to the angular shifting axis (10) of the
splicing head (GS, GR) and axially sliding in a
portion integral with the head itself.

5 8. A device for splicing webs, wrapping paper webs
particularly paper webs for cigarettes, the whole or
in part substantially as described, shown and for
the above mentioned purposes.

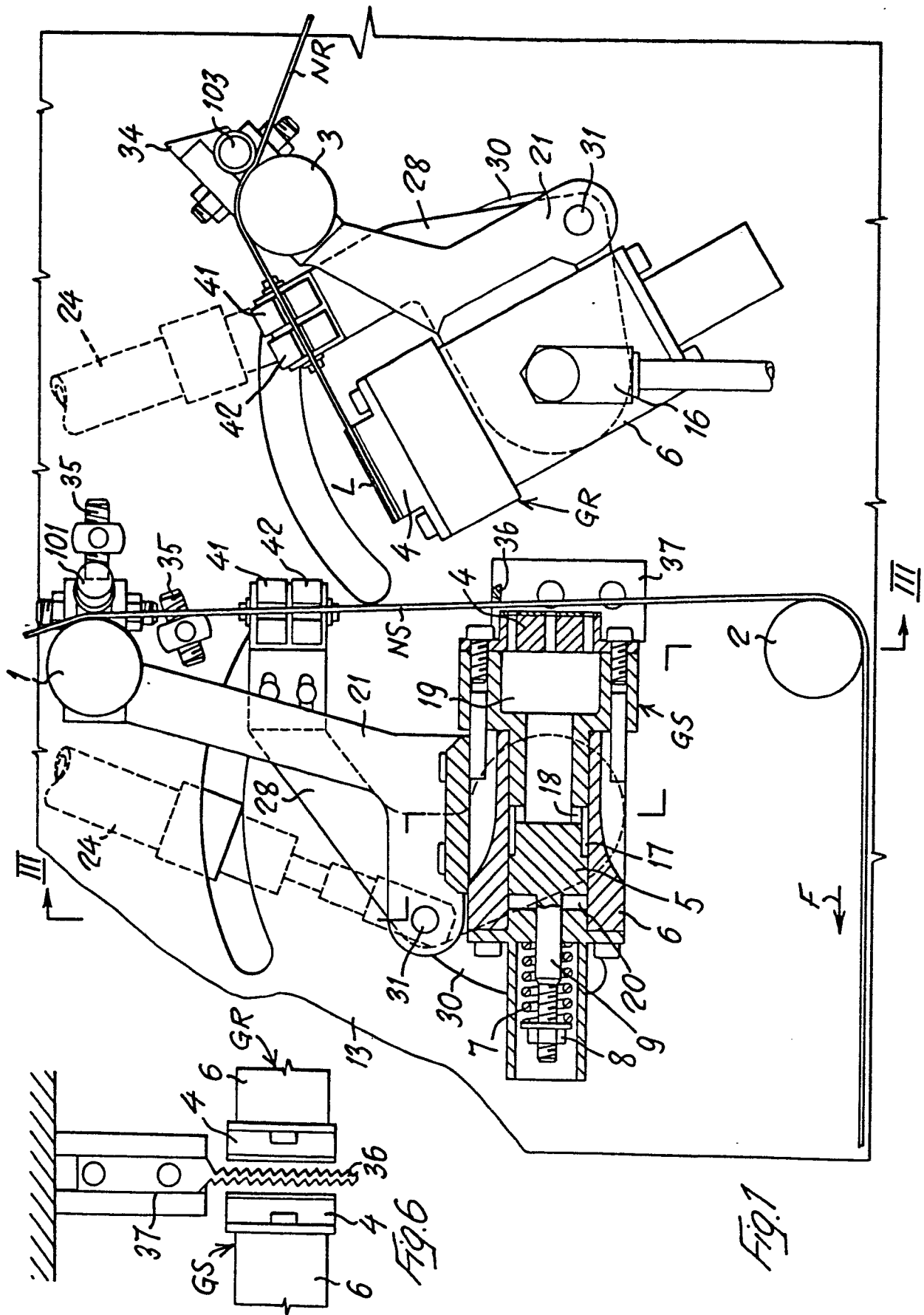
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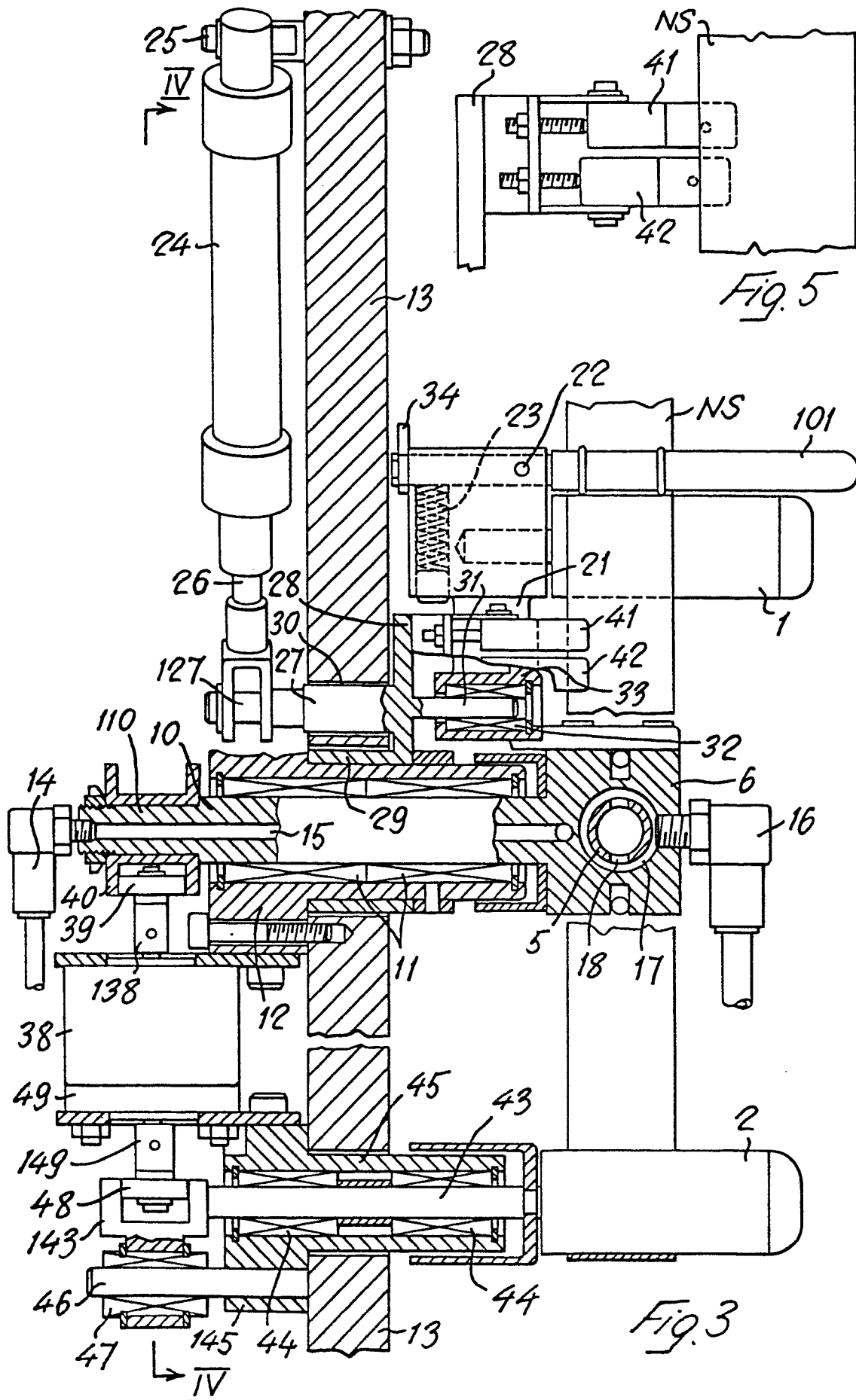
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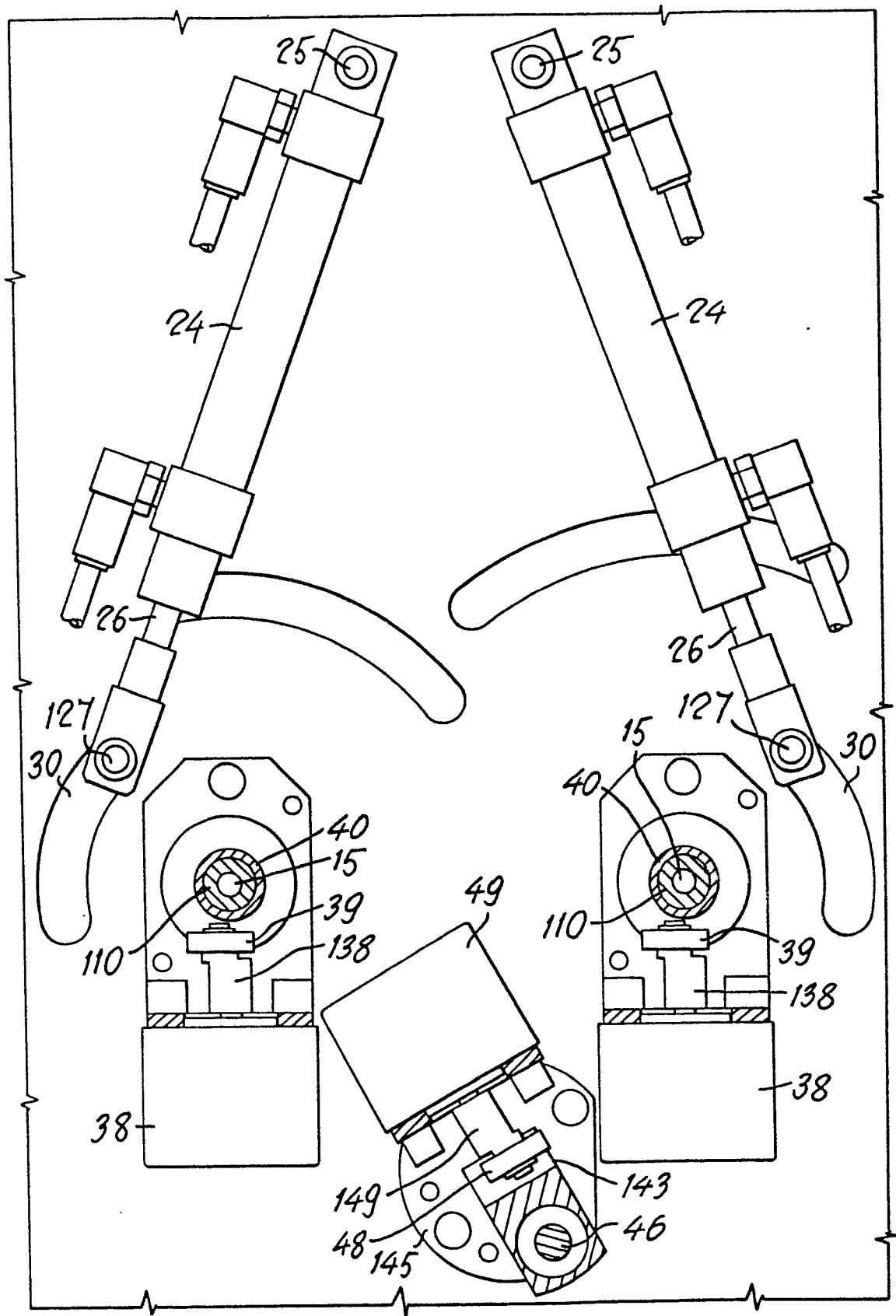


Fig. 4



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 85107824.6
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int Cl 4)
Y	DE - A1 - 2 701 438 (AMF INC.) * Fig. 1-3; specification page 6, lines 2-10; claims 1-3 * --	1,2,6,8	B 65 H 19/18 B 65 H 23/032
Y	EP - A3 - 0 067 481 (TEVOPHARM SCHIEDAM B.V.) * Fig. 3,4; specification page 9, line 30 - page 10, line 25 * --	1,6,8	
Y	US - A - 3 753 381 (T. REIME et al.) * Fig. 1,2; abstract * -----	1,2	
			TECHNICAL FIELDS SEARCHED (Int Cl 4)
			A 24 C B 65 H
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 24-09-1985	Examiner SÜNDERMANN
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			