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

(11) Publication number: **0 321 647**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **88111758.4**

(51) Int. Cl.[4]: **D06C 13/00**

(22) Date of filing: **21.07.88**

(30) Priority: **23.12.87 IT 8351987**

(43) Date of publication of application:
28.06.89 Bulletin 89/26

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

(71) Applicant: **Buderus Sell GmbH**
Hüttenweg
D-6348 Herborn Hess. 1(DE)

(72) Inventor: **Pozzi, Ugo**
Frauenalberstrasse 8
D-7500 Karlsruhe 51(DE)
Inventor: **Gerin, Umberto**
Via San Giuliano 37
I-33170 Pordenone(IT)

(74) Representative: **Petraz, Gilberto Luigi**
G.L.P. S.a.s. di Gilberto Petraz P.le Cavedalis 6/2
I-33100 Udine(IT)

(54) Shearing table for textile surfaces.

(57) Shearing table (10) for textile surfaces (12) which comprises a work platform (11) on which such textile surfaces (12) are positioned, the work platform (11) having advantageously a rectangular geometric shape, on which table (10) is comprised a headstock (17) which shears the textile surfaces (12) and can slide on a support (15) secured to the shearing table (10) in a position parallel to the longer side of the table (10), the support (15) extending along the whole length of the longer side and being positioned above the work platform (11) of the table (10) substantially in correspondence with the outer edge of the work platform (11), the table (10) comprising also a gripper assembly (23) cooperating with the textile surfaces (12) in a position parallel to the longer side of the shearing table (10), the gripper assembly (23) being suitable to move the textile surfaces (12) on the work platform (11) in a direction at a right angle to the direction of the sliding of the shearing headstock (17) on the support (15).

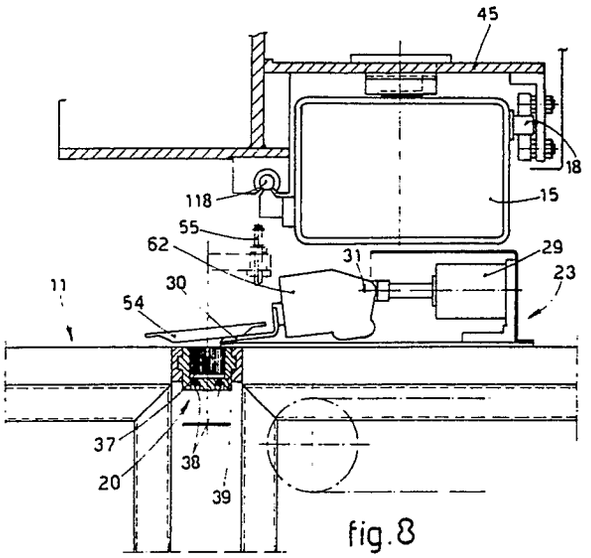

fig.8

EP 0 321 647 A1

SHEARING TABLE FOR TEXTILE SURFACES

This invention concerns a shearing table for textile surfaces. To be more exact, the invention concerns a table on which a shearing headstock slides on a support secured to the table in a position parallel to one of the sides of the table while the textile surface is caused to move in a direction at a right angle to the direction of sliding of the shearing headstock.

The invention is employed for the automatic shearing of textile surfaces of any material, advantageously in cooperation with a connected system of scanning of textile models.

The invention is also suitable for the manual shearing of textile surfaces.

The present applicant has designed, tested and embodied a table suitable for the automatic or manual shearing of textile surfaces of any type.

One purpose of the applicant was to embody a very versatile table on which the machine operative should have easy access to the textile surface on which he has to operate.

Such easy access must be ensured also in the event of large surfaces to be sheared, as is required on the market.

A further purpose was to embody a shearing table able to work in connection with systems which scan textile models. Such systems scan the image of the model to be reproduced and convert it into electrical signals which are sent to a data processing unit.

The data processing unit in turn is connected to the shearing table, which, substantially at the same time or after a delay, depending on requirements, proceeds to shear textile surfaces in correspondence with the model scanned.

The shearing table consists of a structure including a work platform on which are positioned, generally in layers superimposed on each other, the textile surfaces to be sheared.

Having regard to the usual sizes of the width and length of the textile surfaces, the work platform of the shearing table is advantageously, but not only, of a rectangular type and we shall refer in the description hereinafter to a work platform having such a geometric configuration.

A support for a shearing headstock is secured to the shearing table and positioned above the work platform and parallel to the long side of the platform. This support extends along the whole length of the work platform and comprises means to actuate and guide the shearing headstock that runs on the support.

The support is located advantageously above the work platform and in the neighbourhood of one of the edges thereof.

The shearing table includes also a gripper assembly parallel to and above the long side of the work platform, the gripper assembly being suitable to grip the textile surfaces to be sheared.

When the gripper assembly has been actuated to hold the textile surfaces, it is made to move on the work platform in a direction at a right angle to the support and thus to the shearing headstock that runs on the support.

An aspiration system is connected to the gripper assembly and, in cooperation with the layers of textile surfaces superimposed one on another, obtains compaction of those surfaces and their adhesion to the work platform, thus assisting the successive shearing action.

The action of compacting the textile surfaces by the aspiration of air is made effective by wrapping those surfaces with a material impermeable to air.

The shearing table includes, in correspondence with the work platform, blower means which, in cooperation with the side of the material wrapping the textile surfaces which is in contact with that platform, create an air-cushion zone that assists the movement of the textile surfaces on the work platform by the gripper assembly.

The shearing headstock consists of a structure that bears means to actuate a bladed tool having the function of shearing the textile surfaces.

The bladed tool performs a reciprocating vertical motion and a rotary movement about its own axis so as to be able to follow continuously the outline to be sheared on the textile surfaces.

Such movements of the bladed tool work in combination with the lengthwise movement of the shearing headstock on its own support.

The above movements are governed by variable-speed laws which depend on the profiles to be sheared and on the materials of which the textile surfaces consist.

A pressure element cooperates with the bladed tool in the shearing operation and is suitable to prevent the textile surface expanding outwards during the steps of withdrawing the blade from the textile surface.

The shearing headstock comprises a sharpener means which provides for the sharpening of the bladed tool whenever a drop in efficiency of the tool occurs during shearing.

The shearing headstock is also equipped with a means suitable to enable a machine operator to perform shearing by hand. The operator follows the outline to be sheared by applying the required working sequences to the shearing headstock.

The work platform comprises, in coordination with the support of the shearing headstock and in correspondence with the position of the bladed tool in relation to that platform, a lengthwise groove in which a slider with a brush is made to slide.

Such slider with the brush is displaced in synchronization with the lengthwise movement of the bladed tool and cooperates with such tool upon each performance of a vertical shearing travel by the blade.

According to the invention the shearing table is equipped with an electronic apparatus able to converse with a data processing unit so as to actuate automatically the functioning of all the above means.

The invention is therefore embodied according to the contents of Claim 1 and the claims dependent thereon. The attached figures, which are given as a non-restrictive example, show the following:

Fig.1 shows a diagrammatic plan view of a shearing table according to the invention;

Fig.2 is a side view of the longer side of the shearing table of Fig.1;

Fig.3 is a side view of the shorter side of the shearing table of Fig.1;

Fig.4 shows a side view of the gripper assembly with the relative controls;

Fig.5 shows the means which actuate the shearing headstock and the slider with the brush;

Fig.6 gives a diagrammatic side view of the shearing headstock;

Fig.7 gives a side view of the pressure element and the gripper assembly;

Fig.8 shows a side view of the gripper assembly in its final working position.

A shearing table 10, which advantageously has a rectangular conformation, comprises a work platform 11 on which are positioned textile surfaces 12 that generally consist of several layers superimposed one on another.

A bridge-type structure 13 consisting of uprights 14 and a cross member support 15 is fixed parallel to the longer side of the shearing table 10 and near to one of the outer edges of that table 10.

A shearing headstock 17 capable of a straight, reciprocating movement along the support 15 is made to slide along the support 15 by the action of a drive belt 16.

The shearing headstock 17, which is suitably guided on slide guides of the support 15, comprises a shearing tool referenced with 19 in Figs.1, 2 and 3.

A slider 20 with a brush cooperates with the shearing tool 19 and is able to move along the length of the table 10 within a groove 58 in synchronization with the shearing headstock 17, being driven by an actuation assembly 21.

The shearing headstock 17 is equipped with an arm 22 and suitable control means for manual performance of the shearing of textile surfaces 12 by a machine operator.

A gripper assembly 23, which is driven on the work platform 11 in a direction at a right angle to the support 15 of the shearing headstock 17, is included on the shearing table 10.

The gripper assembly 23 is driven by two lateral drive belt assemblies 24.

As shown in Fig.4, the gripper assembly 23 consists of a slide block 25 rigidly connected to a toothed belt 26 driven by the drive belt assemblies 24, the slide block 25 being guided in its movement along a shaft 27 by ball bushings 28.

The slide block 25 bears a plurality of control means, jacks 29 for instance, for the opening and closure of grippers 30 cooperating with the textile surfaces 12. Such action of opening and closure is obtained with an oscillatable plate 62 by means of cooperation of a pivot 31 of the plate 62 with a first pin 32 and aperture 33 together with a guide slot 34 and second pin 132.

The slide block 25 comprises also a duct 35 connected to an aspiration system to carry out an action of compaction of the textile surfaces 12 through aspiration holes 63 for the shearing operation.

A lengthwise flexible packing 64 is included in correspondence with the duct 35 so as to make the aspiration action effective.

In Fig.4 nozzles 36 are shown in correspondence with the work platform 11 and are connected to a blower system to lift the textile surfaces 12 during their movement by the gripper assembly 23 on the work platform 11.

Fig.5 shows the brush slider 20 and the relative actuation assembly 21. The slider 20 consists of a brush 37 which advantageously has bristles made of a plastic material or of natural fibres or the like and which is secured at 38 to a slide block39, which is connected to a belt 40 of the actuation assembly 21.

The belt 40 comprises some notches able to cooperate with teeth 41 of sprocket wheels 42 in providing actuation of a positive type.

The vertical extent of the brush slider 20 depends on the length of the blade of the shearing tool 19 cooperating with the brush slider 20.

The sprocket wheel 42 is connected by a belt 44 to a sprocket wheel 43 that drives the belt 16 which drives the shearing headstock 17.

Fig.6 shows diagrammatically the shearing headstock 17 positioned on the support 15 and guided thereon by slide guides 18-118. The headstock 17 comprises a frame 45 which bears a first motor 46. The first motor 46 drives, through a suitable transmission, an eccentric pivot 47 which

drives, through a connecting rod 48, a blade 49 of the shearing tool 19 with a reciprocating, vertical movement.

The blade 49 has a generally rectangular section and slides within a coordinated slit in a cylindrical jacket 52 of the shearing tool 19.

A second motor 50 is connected by normal transmission means 51 to the cylindrical jacket 52 of the shearing tool 19 so as to obtain rotation of the blade 49. Such rotation and also the vertical shearing movement are needed, while following the outline to be sheared in the textile surfaces 12, so as to present always the cutting edge of the blade 49.

The axis of rotation of the jacket 52 coincides with the centre line of the blade 49, and in this way it is possible to carry out quick changes of direction during the shearing even where the blade 49 has a fairly large width.

A sharpening means 53 is connected to the shearing tool 19 and can be suitably displaced to bring a sharpening tool, such as a grinding wheel 59 for instance, into contact with the blade 49. This sharpening means 43 will be connected advantageously to the shearing tool 19 since the blade 49 will need to be sharpened relatively often.

So as to perform such sharpening, the blade 49 together with the first motor 46 and the means connected thereto will be raised vertically by a suitable lifting means (which is not shown in the figure) that acts on a movable support 60 of the first motor 46 in the direction of the arrow 61.

A thrust element 54 suitable to compress the textile surfaces 12 when the blade 49 is withdrawn from those surfaces 12 cooperates with the shearing tool 19. This thrust element 54 is advantageously capable of being rocked (see Fig.7) so that it can work efficiently even when the sharpening tool 19 is located in the neighbourhood of the grippers 30, thereby reducing the wastage of textile materials during the shearing operation.

For this purpose the thrust element 54 is supported by two pins 55 able to slide on a support 56, such pins 55 cooperating with the thrust element 54 by means of an articulated joint 57.

Fig.8 shows the gripper assembly 23 in a position corresponding to its furthest movement in the direction of the shearing headstock 17. The figure makes clear the reciprocal positions of the gripper 30, thrust element 54 and brush slider 20.

Claims

1 - Shearing table (10) for textile surfaces (12) which comprises a work platform (11) on which such textile surfaces (12) are positioned, the work platform (11) having advantageously a rectangular geometric shape, which table (10) is characterized in that it comprises a headstock (17), which shears the textile surfaces (12) and can slide on a support (15) secured to the shearing table (10) in a position parallel to the longer side of the table (10), the support (15) extending along the whole length of the longer side and being positioned above the work platform (11) of the table (10) substantially in correspondence with the outer edge of the work platform (11), the table (10) comprising also a gripper assembly (23) cooperating with the textile surfaces (12) in a position parallel to the longer side of the shearing table (10), the gripper assembly (23) being suitable to move the textile surfaces (12) on the work platform (11) in a direction at a right angle to the direction of the sliding of the shearing headstock (17) on the support (15).

2 - Shearing table (10) as claimed in Claim 1, in which the shearing headstock (17) comprises the following reciprocally cooperating means:
- a shearing tool (19) with a blade (49) to shear the textile surfaces,
- a first motor (46) to actuate vertical, reciprocating movement of the shearing blade (49),
- transmission means (47-48) to obtain vertical, reciprocating movement of the shearing blade (49),
- a second motor (50) to provide rotary movement of the shearing tool (19) about its axis,
- a means (53) to sharpen the shearing blade (49), and
- an element (54) to thrust the textile surfaces (12).

3 - Shearing table (10) as claimed in Claim 1 or 2, in which the first motor (46) is solidly fixed to a vertically movable support (60).

4 - Shearing table (10) as claimed in any claim hereinbefore, in which the element (54) to thrust the textile surfaces (12) is of a type capable of being rocked.

5 - Shearing table (10) as claimed in any claim hereinbefore, in which the shearing headstock (17) comprises an arm (22) for manual performance of the shearing.

6 - Shearing table (10) as claimed in any claim hereinbefore, in which the shearing headstock (17) slides on the support (15) with a straight movement at a variable speed.

7 - Shearing table (10) as claimed in any of Claims 1 to 5 inclusive, in which the shearing headstock (17) slides on the support (15) with a straight movement at a constant speed.

8 - Shearing table (10) as claimed in any claim hereinbefore, in which the axis of rotation of the shearing tool (19) coincides with the centre line of the shearing blade (49).

9 - Shearing table (10) as claimed in any claim hereinbefore, in which the gripper assembly (23) includes a slide block (25) which comprises a plurality of jacks (29), oscillatable plates (62), an aspiration duct (35) and grippers (30).

10 - Shearing table (10) as claimed in any claim hereinbefore, in which the aspiration duct (35) is connected to the textile surfaces (12) to be sheared.

11 - Shearing table (10) as claimed in any claim hereinbefore, in which an impermeable, flexible element is wrapped about the textile surfaces (12) to be sheared.

12 - Shearing table (10) as claimed in any claim hereinbefore, which comprises a plurality of nozzles (36) connected to a fluid-blower system and opening onto the work platform (11).

13 - Shearing table (10) as claimed in any claim hereinbefore, in which the work platform (11) includes a groove (58) extending parallel to the longer side of the shearing table (10).

14 - Shearing table (10) as claimed in any claim hereinbefore, which comprises a slider (20) with a brush able to move along the groove (58).

15 - Shearing table (10) as claimed in any claim hereinbefore, in which the brush slider (20) moves along the groove (58) in synchronization with the movement of the shearing headstock (17).

16 - Shearing table (10) as claimed in any claim hereinbefore, in which the brush slider (20) lies in the groove (58) at a position coordinated with the position of the shearing blade (49) in the shearing headstock (17).

17 - Shearing table (10) as claimed in any claim hereinbefore, in which the brush slider (20) comprises a brush (37) extending vertically by a height greater than the maximum vertical travel of the shearing blade (49).

18 - Shearing table (10) as claimed in any claim hereinbefore, which is equipped with electronic apparatus linked to a data processing unit for the automatic performance of the operation of shearing the textile surfaces (12).

19 - Shearing table (10) as claimed in any claim hereinbefore, in which the shearing of the textile surfaces (12) is carried out, in connection with a device that scans textile models, by means of the data processing unit.

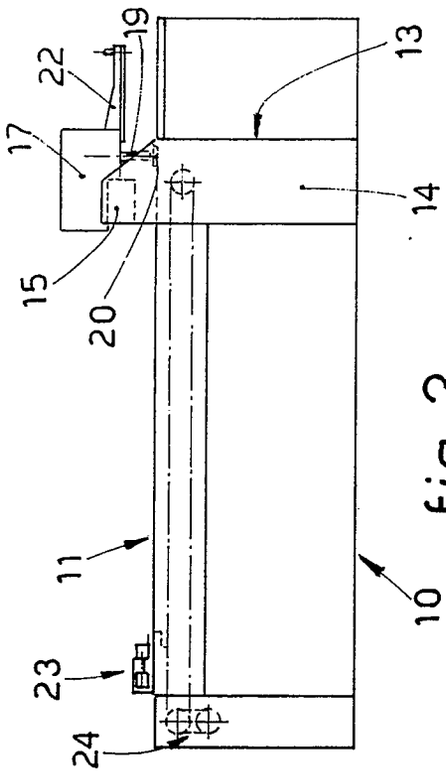

fig.3

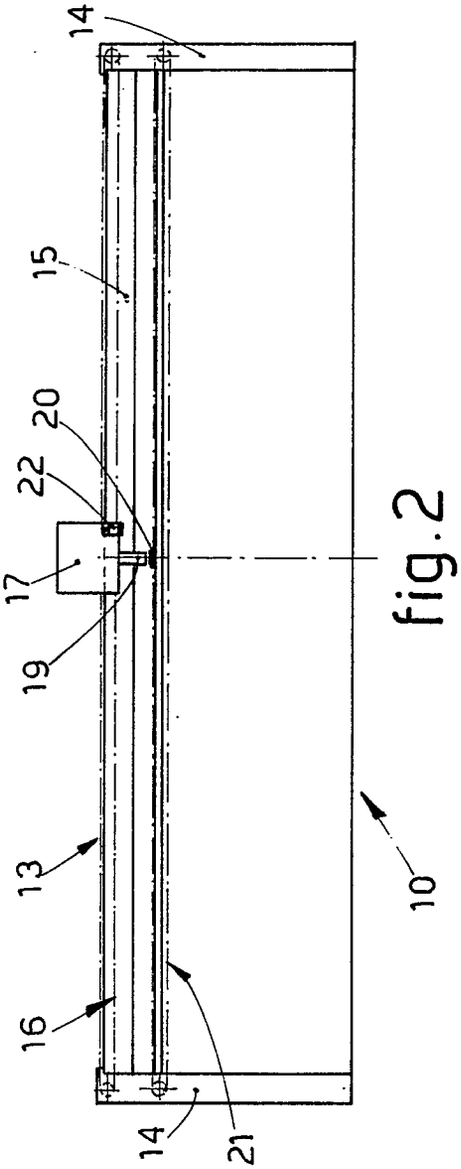

fig.2

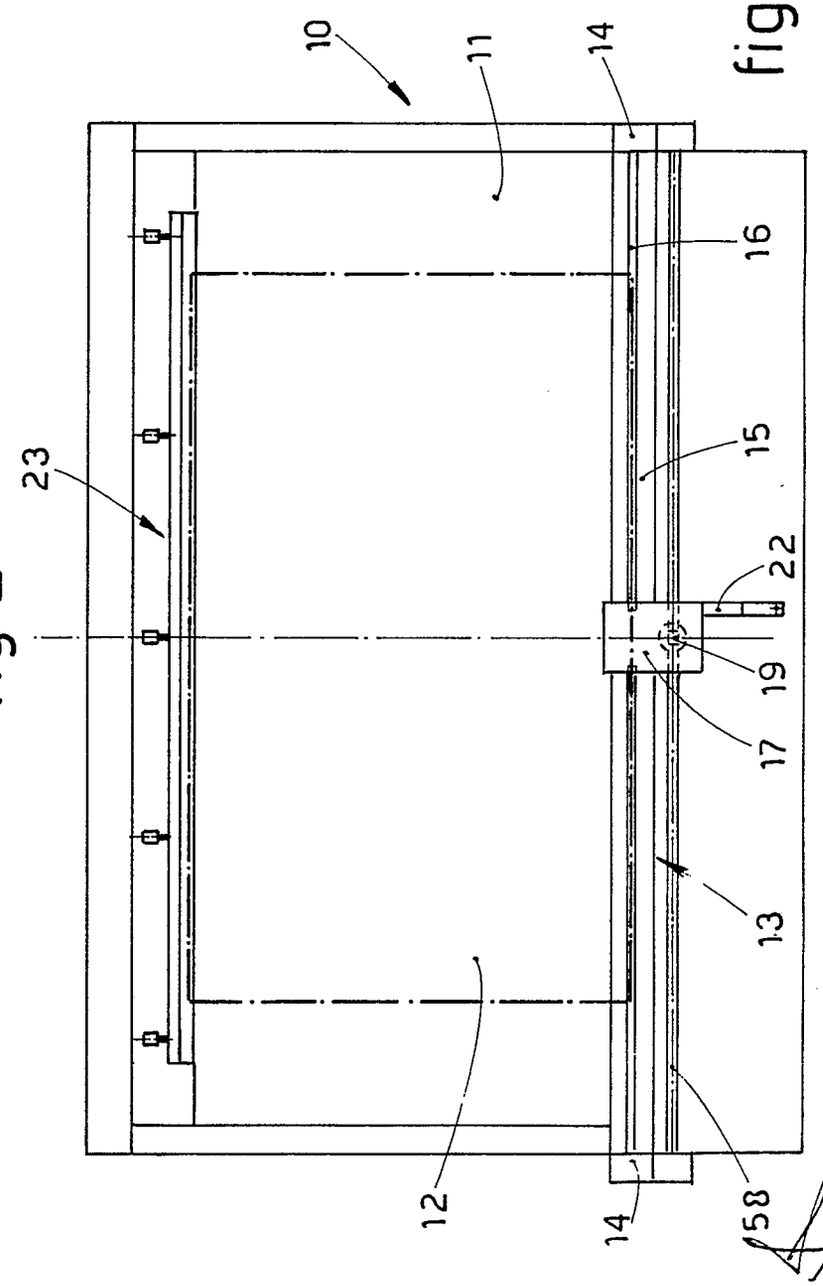

fig.1

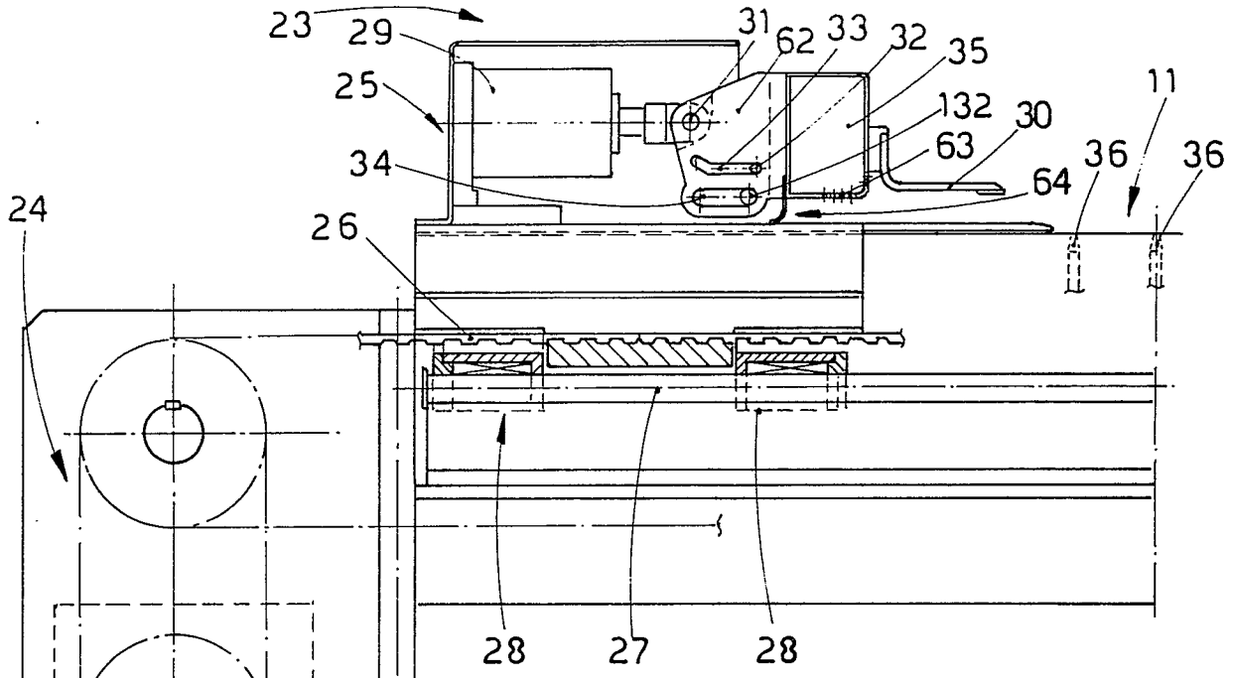
23
29
31
62
33
32
35
25
132
30
11
34
63
36
36
64
24
26
28
27
28

fig.4

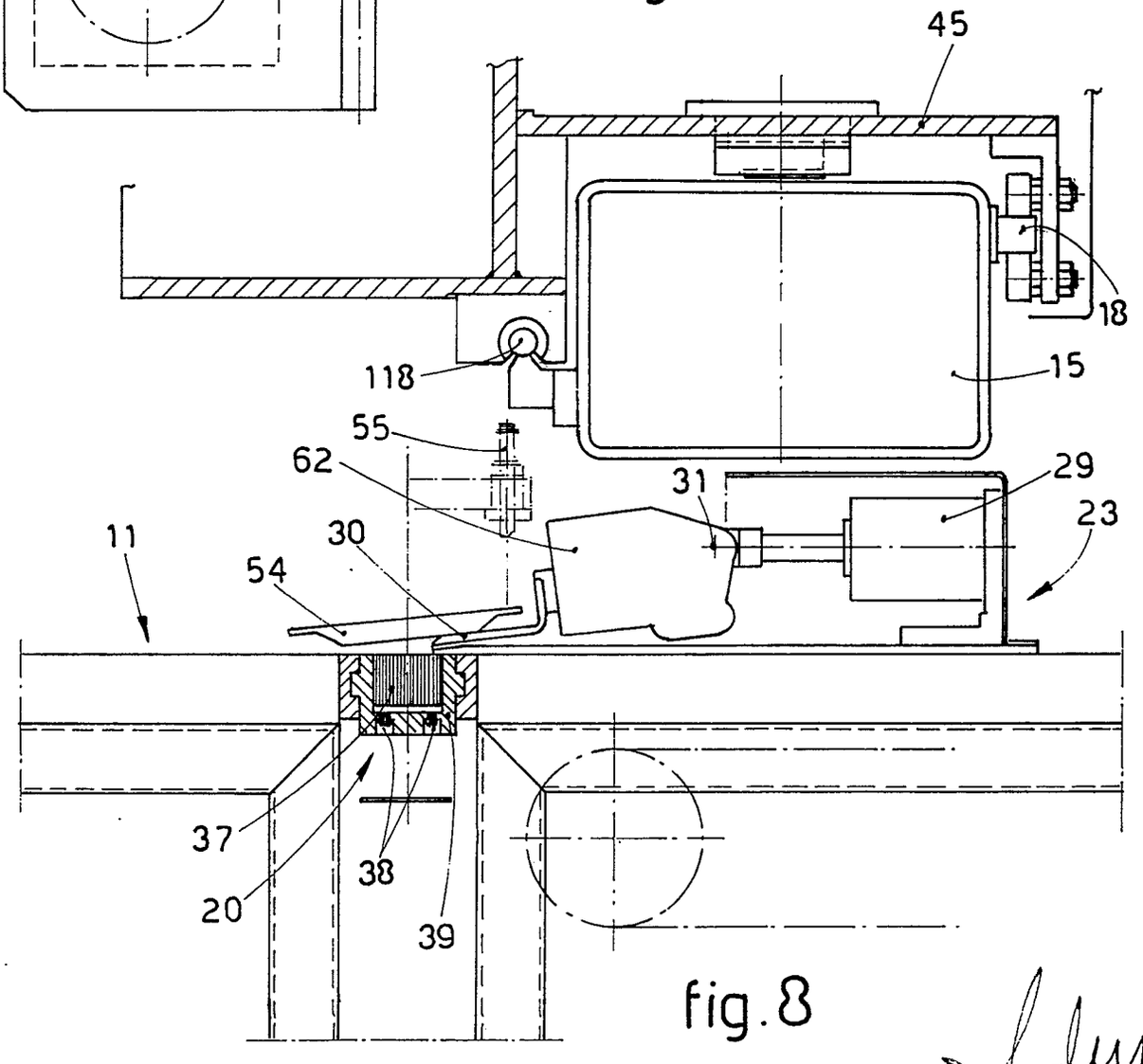
45
18
118
15
55
62
31
29
23
11
30
54
37
38
20
39

fig.8

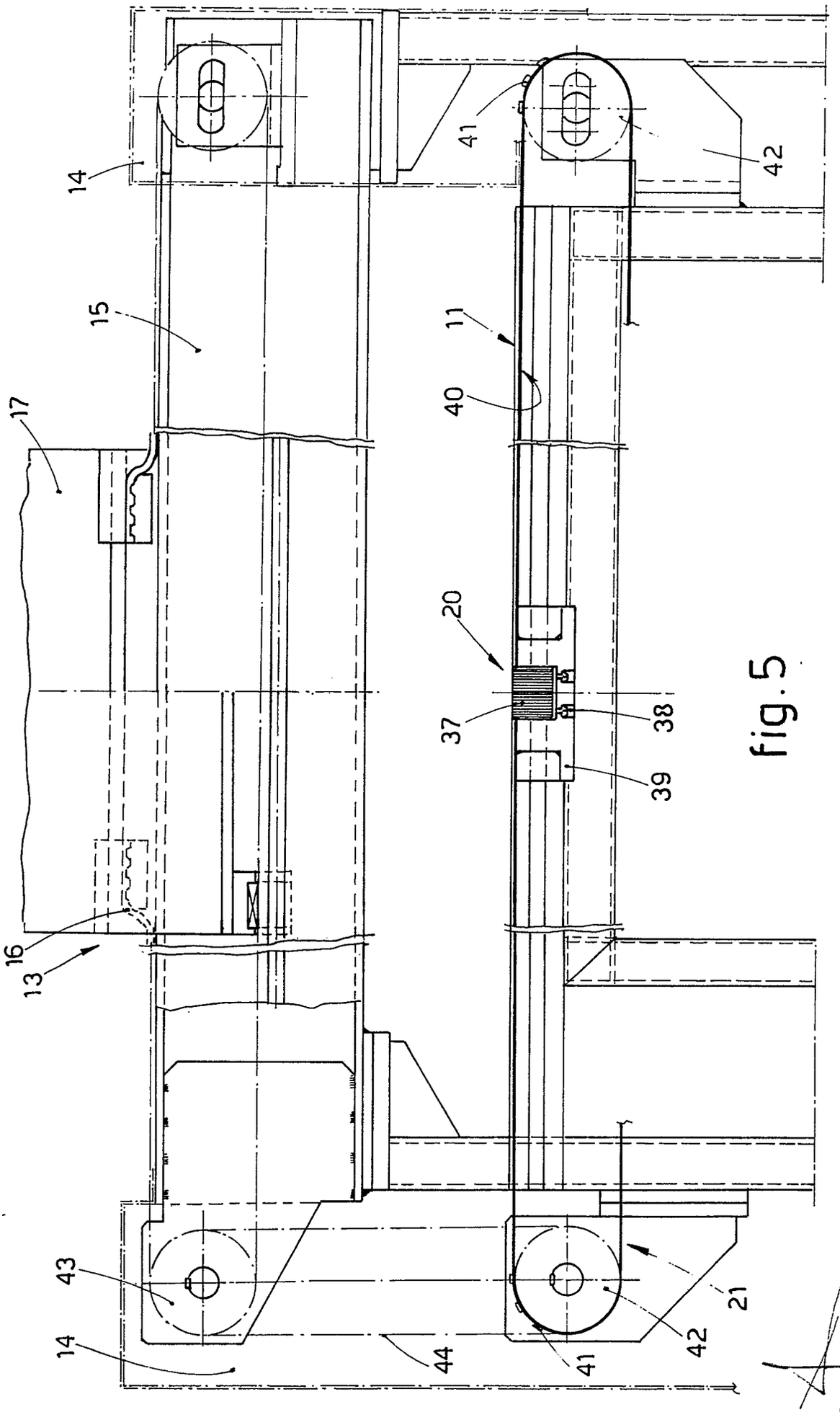

fig.5

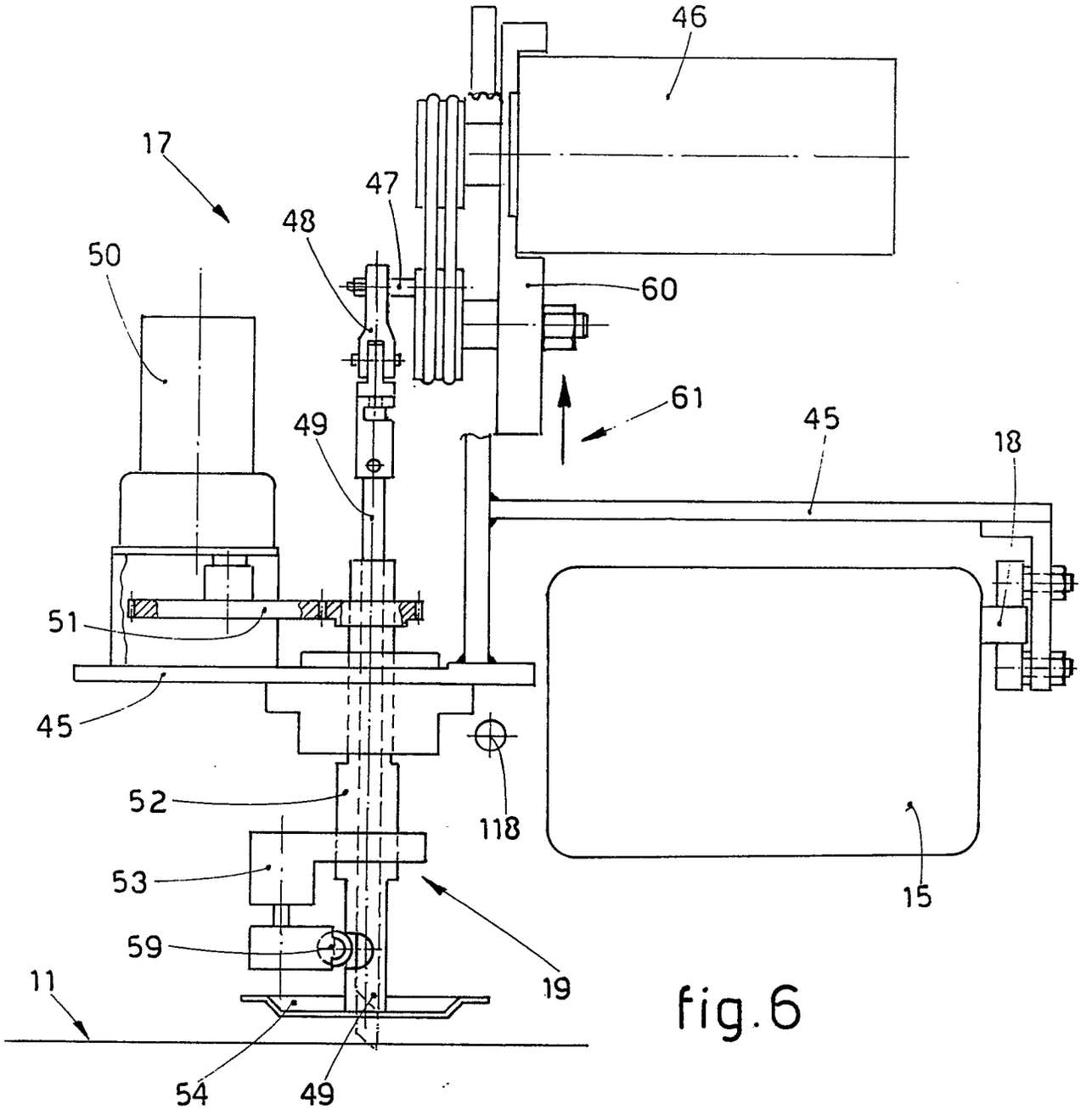
46
17
47
48
50
60
61
49
45
18
51
45
52
118
53
15
59
19
11
54
49

fig.6

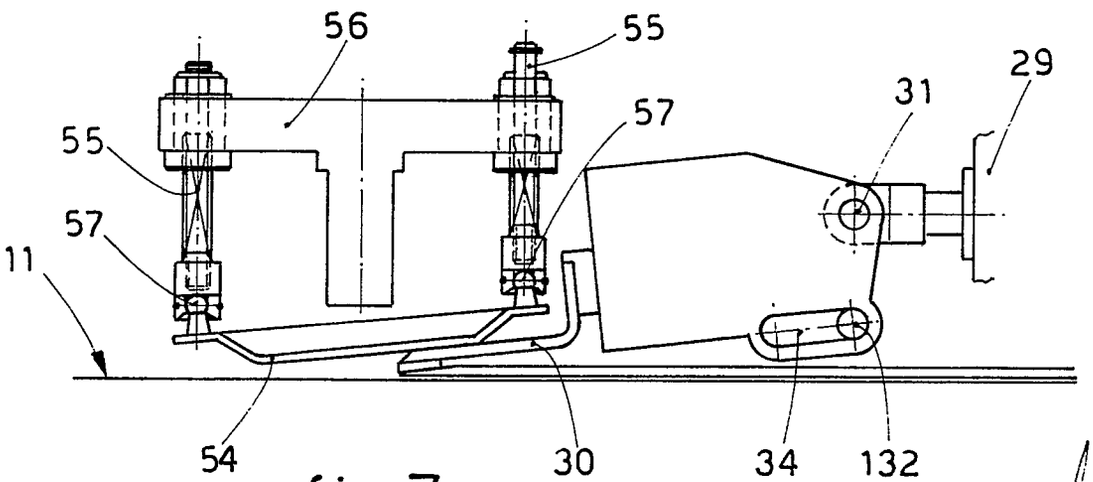
56
55
29
31
55
57
57
11
54
30
34
132

fig.7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 11 1758

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	FR-A-2 194 534 (GERBER)		D 06 C 13/00
A	US-A-3 848 327 (GERBER)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			D 06 C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19-09-1988	PETIT J.P.

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)