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

(11) **EP 2 239 355 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.10.2010 Bulletin 2010/41

(21) Application number: **09157554.8**

(22) Date of filing: **07.04.2009**

(51) Int Cl.:
D01H 5/80 *(2006.01)* ***B24B 5/35*** *(2006.01)*
B24B 19/00 *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

(71) Applicant: **ATAC Insaat ve Sanayi A.S. - ANTEKS Dokuma Fabrikasi**
07190 Antalya (TR)

(72) Inventor: **Günaydin, Yasar**
07190 Antalya (TR)

(74) Representative: **Sevinç, Erkan**
Istanbul Patent & Trademark Consultancy Ltd.
Plaza-33, Büyükdere cad. No: 33/16
Sisli
34381 Istanbul (TR)

(54) **Preparation machine for rectification of a textile machine's rollers**

(57) The present invention proposes a machine (11) having a vibratory feeding receptacle (12) for receiving a plurality of rollers having air guides attached to the axles thereof. Said rollers are then advanced in conjunction with said vibratory feeding receptacle (12) for delivering rollers from such receptacle through an article guide arrangement to an air guide separation device (16). Separated rollers are arranged in rows in a manner to be easily re-installed after maintenance. The apparatus further carries out a cleaning process for cleaning fiber fluff around the axles of the rollers. The present invention therefore substantially shortens maintenance procedure of a ring spinning machine.

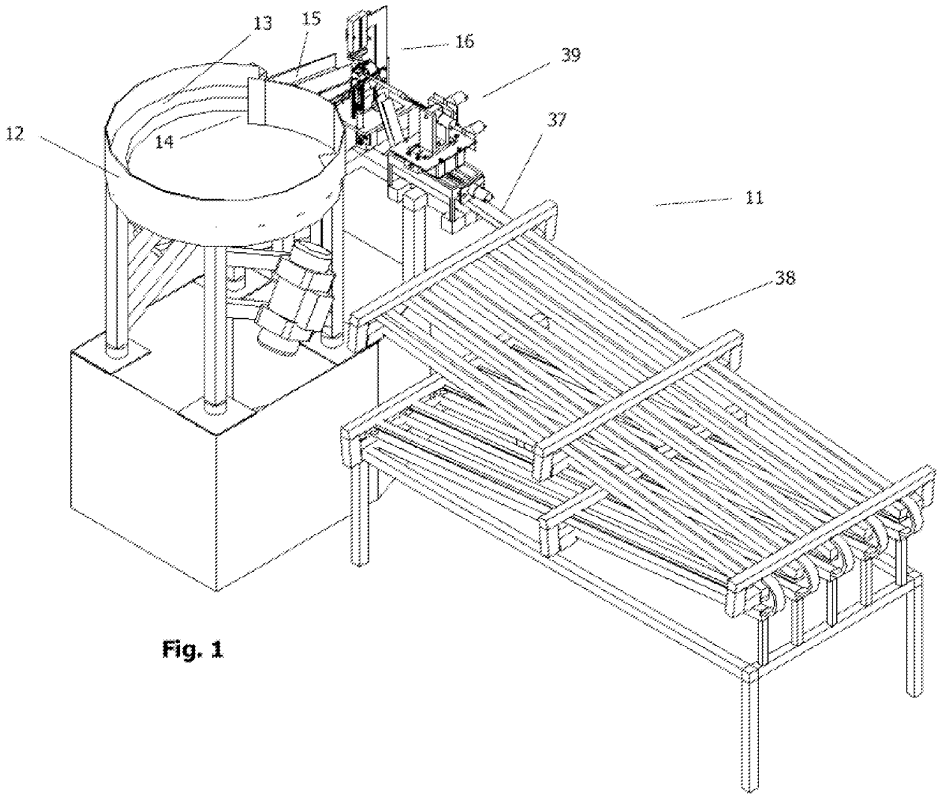


Fig. 1

EP 2 239 355 A1

Description

Technical Field of the Invention

[0001] The present invention relates to a machine for separating rollers of a ring spinning textile machine from air guides connected thereto in an automated manner.

Background of the Invention

[0002] Various textile machines from a plurality of textile machinery manufacturers are presently operated in the country of the present applicant. It is known that ring spinning machines and in particular compact spinning machines provided substantial improvements in the yarn structure in recent years. DE10040073 discloses a ring spinning machine in which a condensing device is disposed between a drafting arrangement and a spinning device. In compact spinning, the drafting system has an aerodynamic condensing mechanism. The fibers at the delivery roller are additionally captured by means of a vacuum in the nip, and are compacted immediately afterwards. Fibers lie much closer together and parallel with each other. Therefore the spinning triangle is reduced to the compacting width. In order to condense the fibers after the main draft, the bottom delivery roller of the drafting unit has been replaced by a perforated drum. Inside each drum is a stationary insert with a specially shaped suction opening connected to the machine's suction system. The air current created by the vacuum condenses the fibers on their way over the perforated drum. The condensation zone fully controls the fibers all the way from the drafting system to the nipping line. An additional pressure cylinder (nip roller) prevents the twist from being propagated into the condensing zone. Compacting efficiency is enhanced by a specially designed air guide element.

[0003] Textile machines of the above-mentioned type require regular maintenance and rectification of the machine parts such as rollers. The air guide elements that are connected to the nip rollers need to be separated from said rollers for maintenance. According to the present invention a vibratory vessel is provided to advance rollers to an air guide separation position. Such vibratory vessels are known in the art. For example US3955336 discloses such a vessel.

[0004] The present invention proposes an automated process specially adapted for shortening maintenance procedure of a ring spinning machine in which rollers are separated from said air guides and fiber fluff is removed from around the axles of said rollers, which are arranged orderly to be reinstalled thereafter.

Objects of the Invention

[0005] One of the objects of the present invention is to provide an automated process in which rollers of a spinning machine are separated from air guides and fiber fluff is removed from around their axles and said rollers are arranged in order to be reinstalled thereafter.

Summary of the Invention

[0006] The present invention proposes a machine having a vibratory feeding receptacle for receiving a plurality of rollers having air guides attached to the axles thereof. Said rollers are then advanced in conjunction with said vibratory feeding receptacle for delivering rollers from such receptacle through an article guide arrangement to an air guide separation device. Separated rollers are arranged in rows in a manner to be easily re-installed after maintenance. The apparatus further carries out a cleaning process for cleaning fiber fluff around the axles of the rollers. The present invention therefore substantially shortens maintenance procedure of a ring spinning machine.

Brief Description of the Figures

[0007] Accompanying drawings are given solely for the purpose of exemplifying a machine for separating rollers of a ring spinning textile machine from air guides in which:

Fig. 1 demonstrates a perspective view of the maintenance machine according to the present invention.

Fig. 2 demonstrates a perspective view of the separation device along with the conveyor according to the present invention.

Fig. 3 demonstrates a perspective view of the separation device alone according to the present invention.

Fig. 4 demonstrates another perspective view of the separation device according to the present invention.

Fig. 5a and 5b demonstrate perspective views of a roller together with an air guide according to the present invention.

Fig. 6a and 6b demonstrate perspective views of the separation head according to the present invention.

Fig. 7 demonstrates a perspective view of the separation device along with the cleaning device according to the present invention.

Fig. 8 demonstrates a perspective view of the cleaning device according to the present invention.

Detailed Description of the Invention

[0008] Referring now to the figures outlined above, the present invention proposes a maintenance machine (11)

for automated separation of rollers (22) of a ring spinning machine from the air guides (25) being connected to the axles of said rollers (22). For example compact spinning machines such as K44 and K45 manufactured by the company Rieter comprise such rollers (22) with air guides (25).

[0009] The maintenance machine (11) according to the present invention comprises a vibratory vessel (12) conventionally advancing a plurality of articles in a predetermined trajectory (13). Said trajectory (13) may conventionally have a gradually elevated peripheral base delimited by the outer wall of said vibratory vessel (12), leading to an exit opening (14). Said exit opening (14) itself leads to a conveyor (15), transferring said rollers (22) to a final position. The separation device (16) in Fig. 2 is shown in detail in Fig. 3.

[0010] Referring now to Fig. 3 and 4, the separation device according to the present invention comprises a carrier (17) in the form of two leafs (17a, 17b) being longitudinally hinged for receiving a roller (22) in its final position. A roller (22) is generally in the form of a barbell, i.e. with cylindrical portions (23) at both ends of the axle (24) and with an air guide (25) having planar plates (26) at both ends of a longitudinal rod (27), said rod (27) being releasably attached to the axle of said roller. A roller (22) transferred to the carrier (17) extends longitudinally on said carrier (17) along the hinge portion (18).

[0011] Said separation device (16) further comprises a lining plate (19) advancing back and forth on a shaft (20) to push a roller item on said carrier (17) against a vertical support (21) on the opposite side of said carrier (17). When a roller (22) is transferred to said carrier (17) by said conveyor (15), said lining plate (19) ensures that the roller (22) is properly positioned. Further, an air guide orientation tip (28) rotates to take the air guide (25) portion of said roller (22) from a position on said carrier leaf (17b) to a position on the other carrier leaf (17a), while said roller (22) maintaining its position. In the event that said conveyor (15) transfers said roller (22) with said air guide (25) the latter being properly oriented, i.e. already on the carrier leaf (17a), said air guide orientation tip (28) will run idle.

[0012] When said air guide (25) is properly oriented with respect to the hinge portion (18), said lining plate (19) is for a second time advanced in the direction of said carrier (17) to push said roller (22) against said vertical support (21). Said roller (22) hence properly positioned, a separation head (29) is lowered to detach said roller (22) from said air guide (25).

[0013] Said separation head (29) according to the present invention is specially designed to have a tip portion with an intermediary surface portion (30) facing said carrier (17), said intermediary surface portion (30) being neighbored by two surface portions (31 and 32) at both sides thereof on an axis drawn between two carrier leaves (17a, 17b) perpendicular to said hinge portion's (18) axis. A first neighboring surface (31) on the side of the carrier leaf 17b has a greater surface inclination with respect to the longitudinal axis of the separation head (29) than that of the second neighboring surface (32).

[0014] Said separation head's (29) intermediary surface portion (30) presses on an opening portion (34) between the two arms (35) of said air guide (25) connecting the same to the axle (24) of said roller (22). Further an outwardly curved member (33) provides the effect that its curved tip limits movement of the roller (22) on said carrier (17) while the detached air guide (25) is allowed to fall in a separate receptacle.

[0015] The maintenance machine (11) according to the present invention further comprises a roller (22) axle (24) cleaning device. Fiber fluff accumulated around the axle (24) of the rollers (22) is cleaned by means of a cleaning device (39) according to the present invention. Fig. 7 demonstrates said cleaning device (39) cleaning fiber fluff around the axle (24) of a roller (22) lying on the carrier (17) of the separation device (16). A cleaning tip (42) is installed on a first platform (40) of said cleaning device (39) such that it is rotatable around the axis A-A' of a first motion inducing means (43). Said cleaning tip (42) is also movable a certain distance laterally in the direction of the arrows B-B' (Fig. 8) by a second motion inducing means (44) while at the same time rotating around its own axis to enable said cleaning tip (42) to clean the axle (24) portion remaining between the two cylindrical portions (23) of the roller (22). Rotation of said cleaning tip (42) around its own axis provides the effect that the fluff is entirely drawn from around said axle (24). Said first platform (40) is also movable on a second platform (41) in the direction of the arrows C-C' to draw said cleaning tip (42) near said separation device (16).

[0016] A roller transfer piston (36) on said separation device (16) then lowers said carrier leaf 17b to allow transfer of the roller (22) from said carrier (17) to a guideway (37) having a suitable slope for effecting orderly placement of said roller (22) on a roller carrier (38). While Figures 1 to 4 demonstrate the maintenance machine (11) according to the present invention with the separation device (16) alone, Fig. 7 and 8 demonstrate both separation and cleaning devices (respectively 16 and 39).

[0017] In sum, the present invention proposes a maintenance machine (11) for separating rollers (22) of a compact spinning textile machine from air guides (27) attached to the axles (24) of said rollers (22) and for cleaning fluff from said axles (24) of said rollers (22). Said machine (11) comprises a vibratory vessel (12) for receiving a plurality of rollers (22). Said vibratory vessel (12) has an opening (14) associated with a conveyor (15) transferring said rollers (22) to a position on a carrier (17) of a separation device (16). Said separation device (16) comprises a separation head (29) detaching a roller (22) from said an air guide (25). Said maintenance machine (11) further comprises a cleaning device (39) cleaning fluff accumulated around the axle (24) of the rollers (22).

Claims

1. A maintenance machine (11) for separating rollers (22) of a compact spinning textile machine from air guides (27) attached to the axles (24) of said rollers (22) and for cleaning fluff from said axles (24) of said rollers (22), said machine (11) comprising a vibratory vessel (12) for receiving a plurality of rollers (22), said vibratory vessel (12) having an opening (14) associated with a conveyor (15) transferring said rollers (22) to a position on a carrier (17) of a separation device (16), said separation device (16) comprising a separation head (29) detaching a roller (22) from said an air guide (25), said maintenance machine (11) further comprising a cleaning device (39) cleaning fluff accumulated around the axle (24) of the rollers (22).

2. A maintenance machine (11) according to Claim 1 wherein said separation device (16) comprises a lining plate (19) movable back and forth on a shaft (20) for pushing a roller item on said carrier (17) against a vertical support (21) on the opposite side of said carrier (17).

3. A maintenance machine (11) according to Claim 1 or 2 wherein said carrier (17) is in the form of two leafs (17a, 17b) being longitudinally hinged for receiving a roller (22).

4. A maintenance machine (11) according to Claim 1 or 3 wherein said vibratory vessel (12) comprises a predetermined trajectory (13) for a advancing a plurality of articles, said trajectory (13) having a gradually elevated peripheral base delimited by the outer wall of said vibratory vessel (12).

5. A maintenance machine (11) according to Claim 4 wherein said separation device (16) comprises an air guide orientation tip (28) which is rotatable to take the air guide (25) portion of said roller (22) from a position on said carrier leaf (17b) to a position on the other carrier leaf (17a).

6. A maintenance machine (11) according to any of the preceding claims wherein said separation head (29) comprises a tip portion with an intermediary surface portion (30) facing said carrier (17), said intermediary surface portion (30) being neighbored by two surface portions (31 and 32) at both sides thereof on an axis drawn between two carrier leaves (17a, 17b) perpendicular to said hinge portion's (18) axis.

7. A maintenance machine (11) according to Claim 6 wherein said first neighboring surface (31) on the side of the carrier leaf 17b has a greater surface inclination with respect to the longitudinal axis of the separation head (29) than that of the second neighboring surface (32).

8. A maintenance machine (11) according to Claim 1 or 7 wherein said separation head (29) comprises a curved member (33) limiting movement of the roller (22) on said carrier (17) while the detached air guide (25) is allowed to fall in a separate receptacle.

9. A maintenance machine (11) according to Claim 1 or 8 wherein said cleaning device (39) comprises a cleaning tip (42) movable a certain distance laterally along the axle (24) portion remaining between two cylindrical portions (23) of a roller (22) in by a motion inducing means (44) while at the same time being rotatable around its own axis to enable said cleaning tip (42).

10. A maintenance machine (11) according to Claim 9 wherein said cleaning device (39) comprises a first platform (40) having said cleaning tip (42), said first platform (40) being movable on a second platform (41) to move said cleaning tip (42) back and forth with respect to said separation device (16).

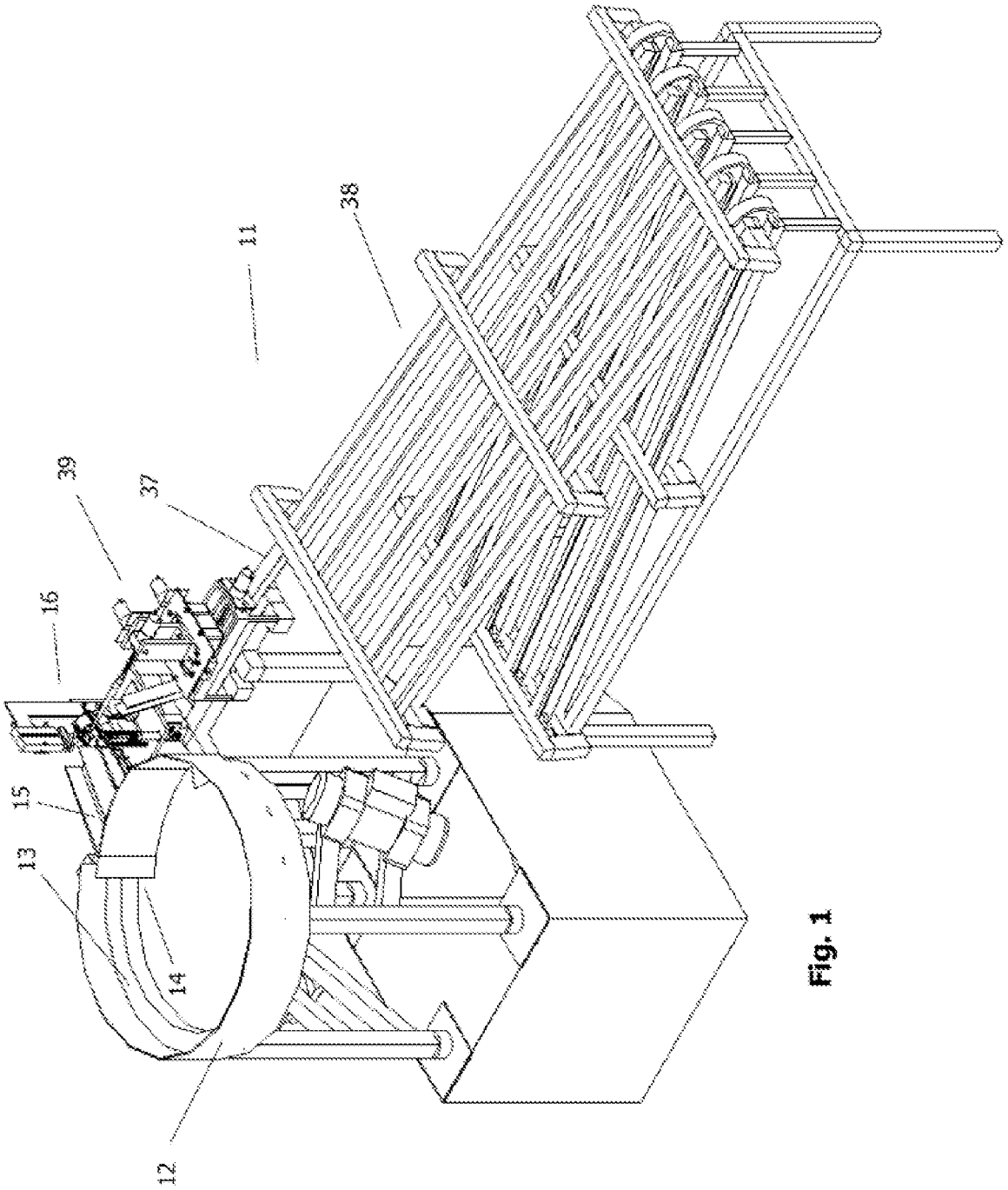


Fig. 1

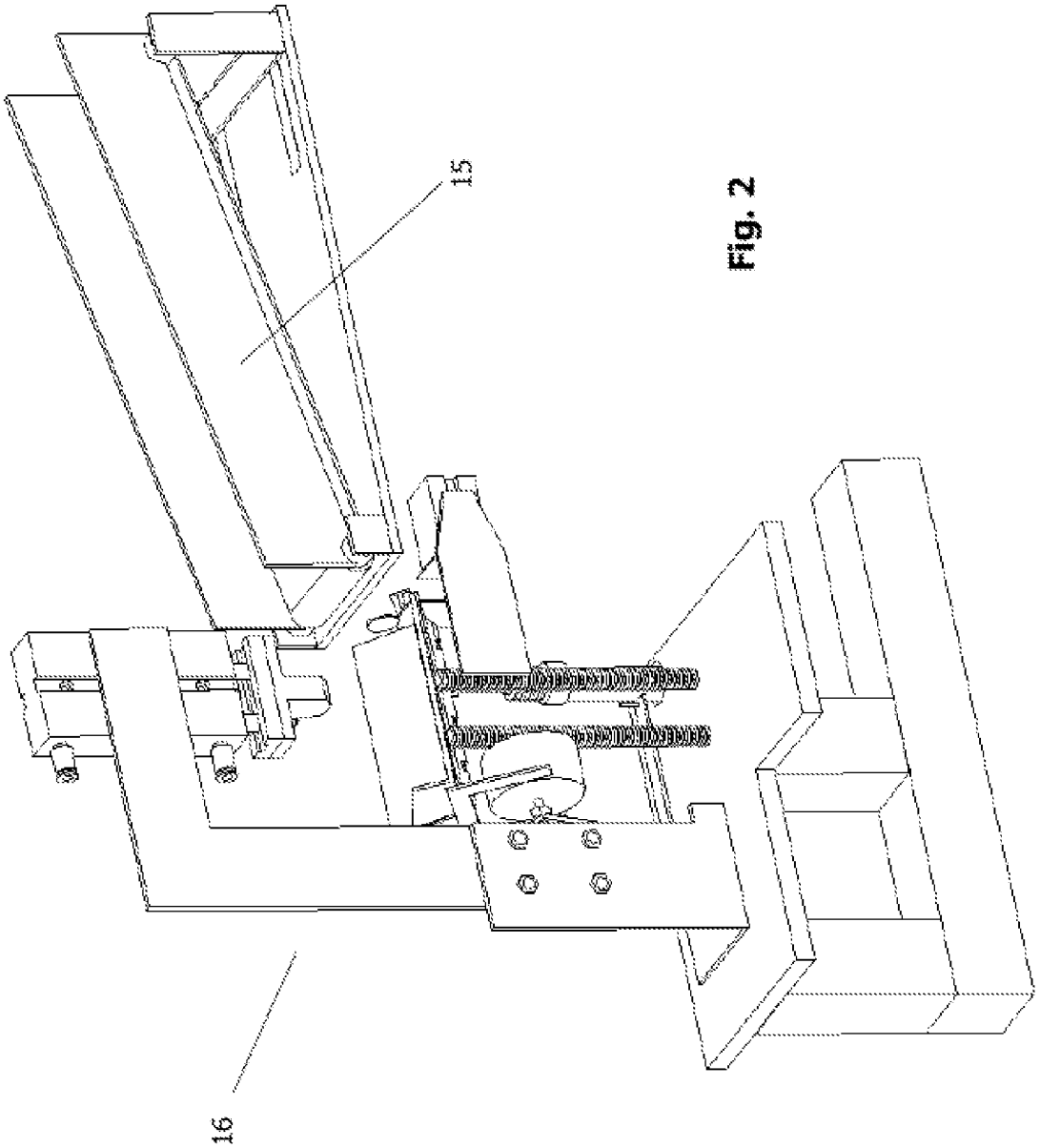


Fig. 2

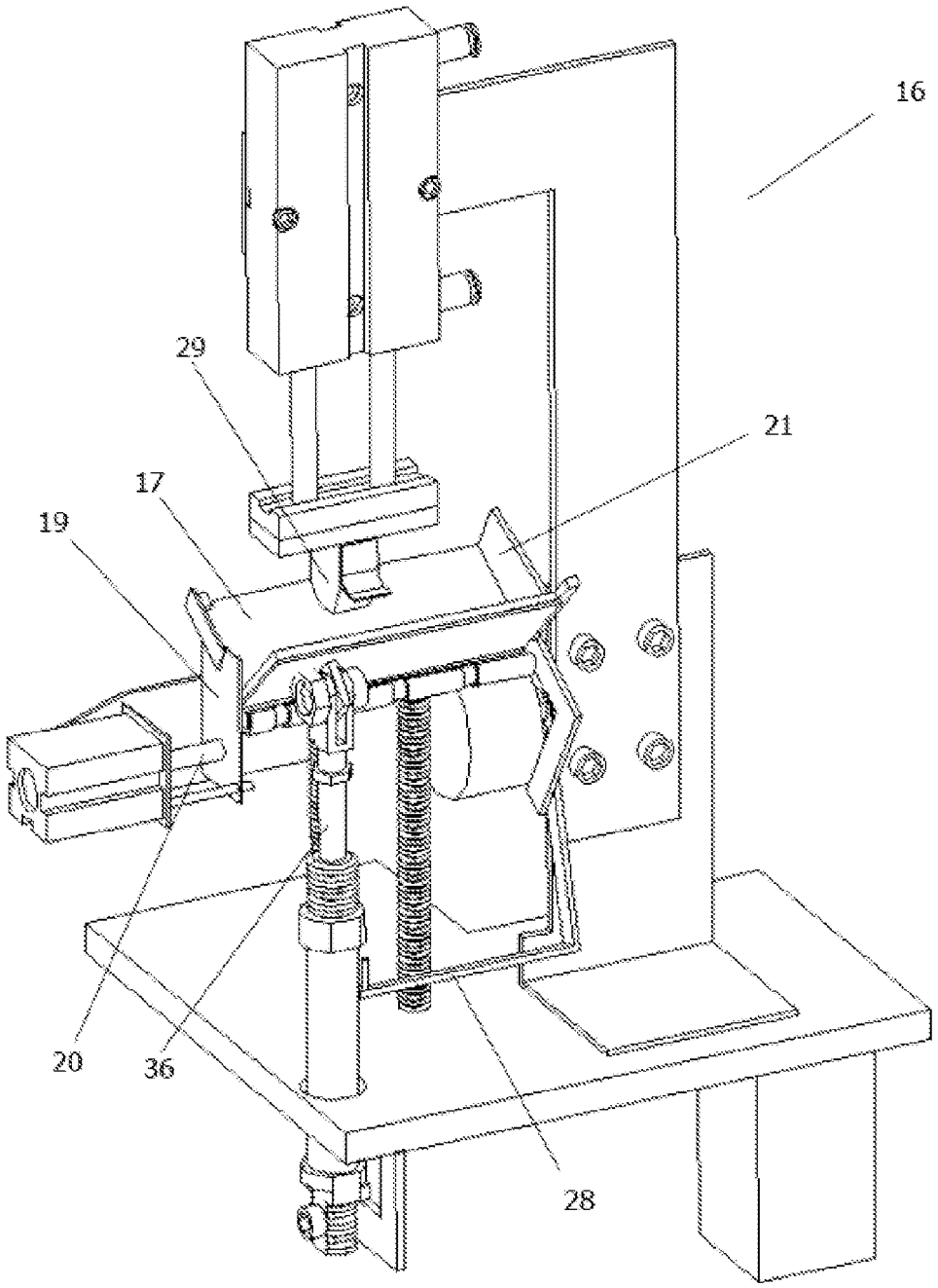
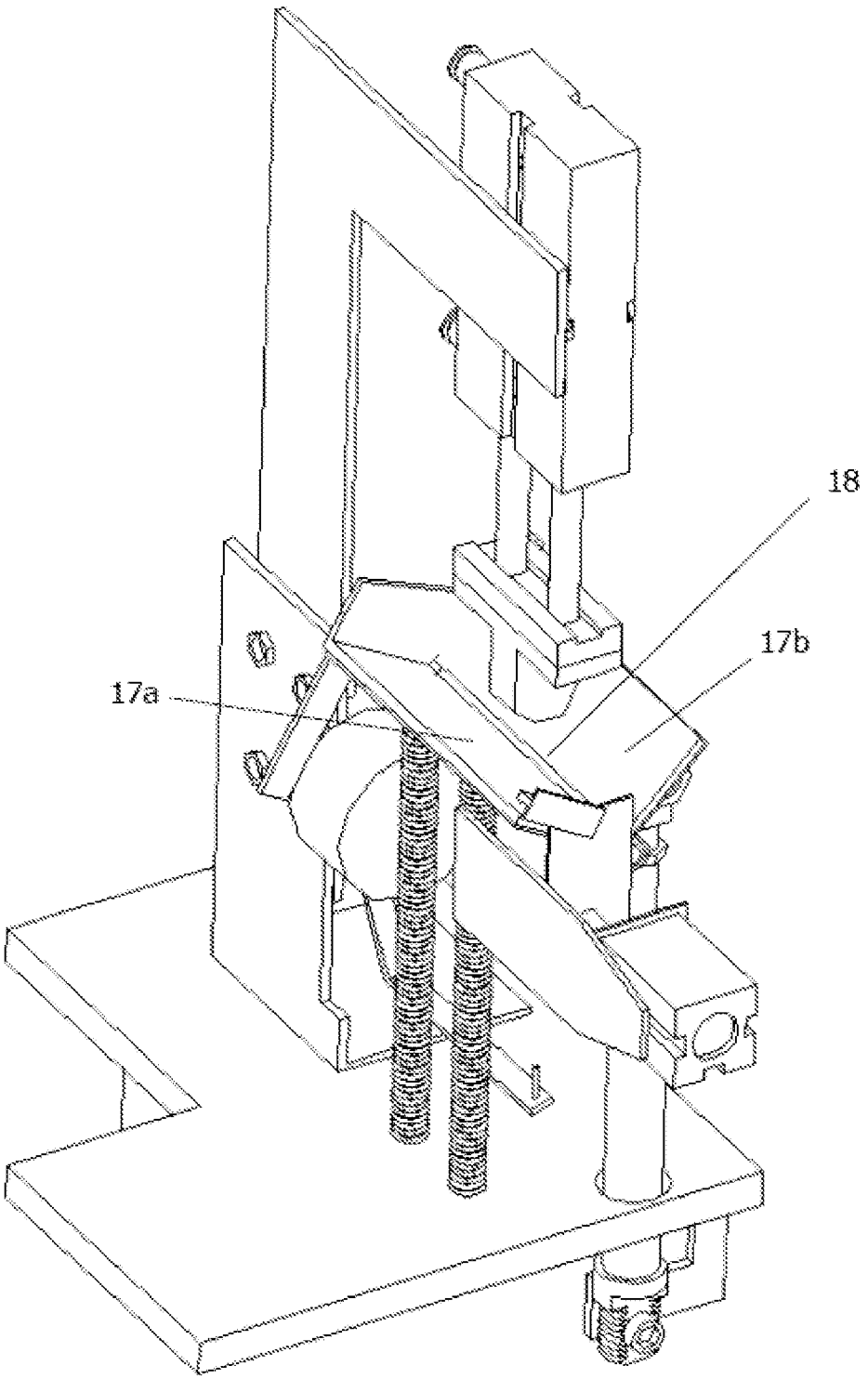


Fig. 3


18
17b
17a

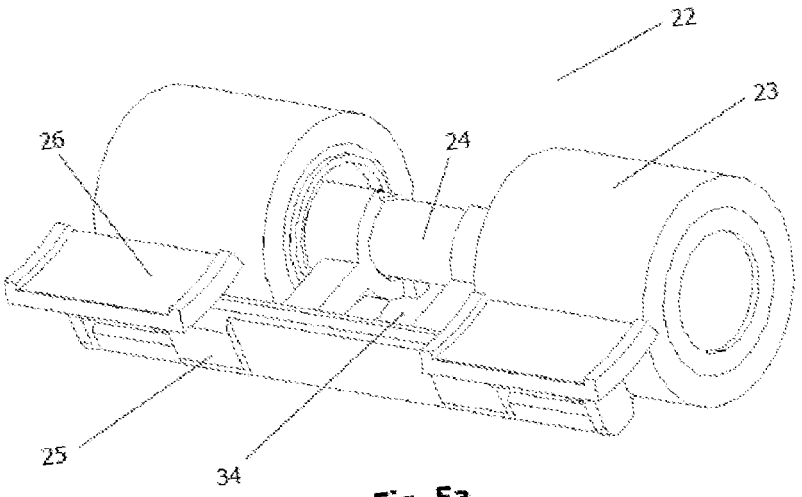


Fig. 5a

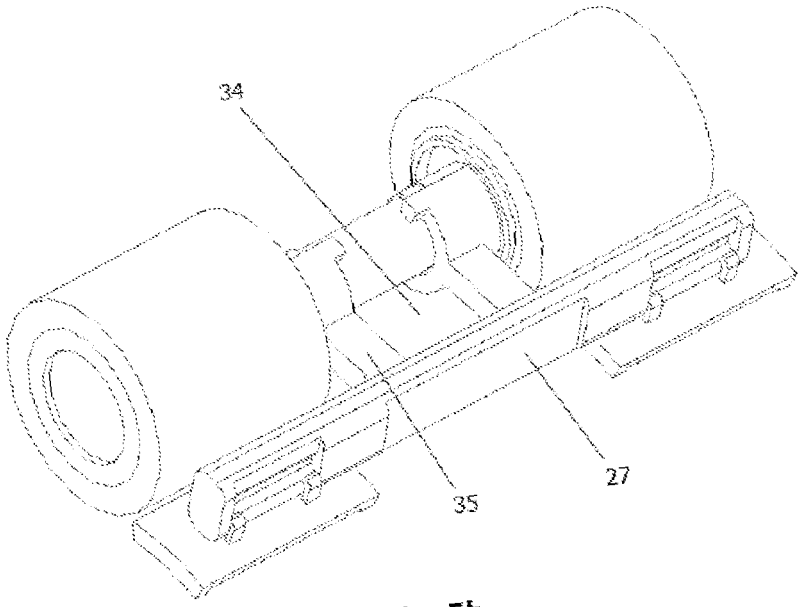


Fig. 5b

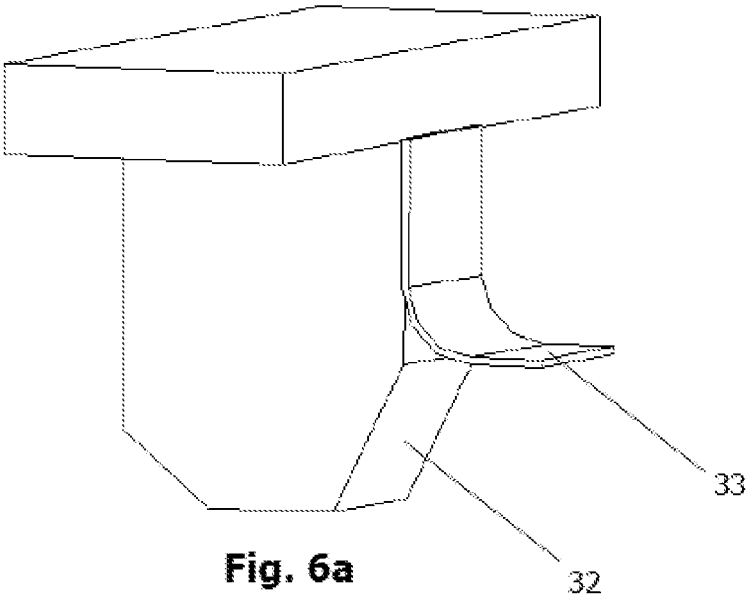


Fig. 6a

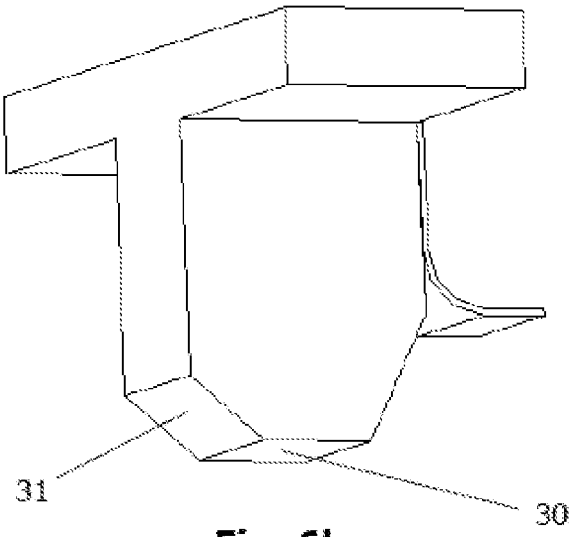


Fig. 6b

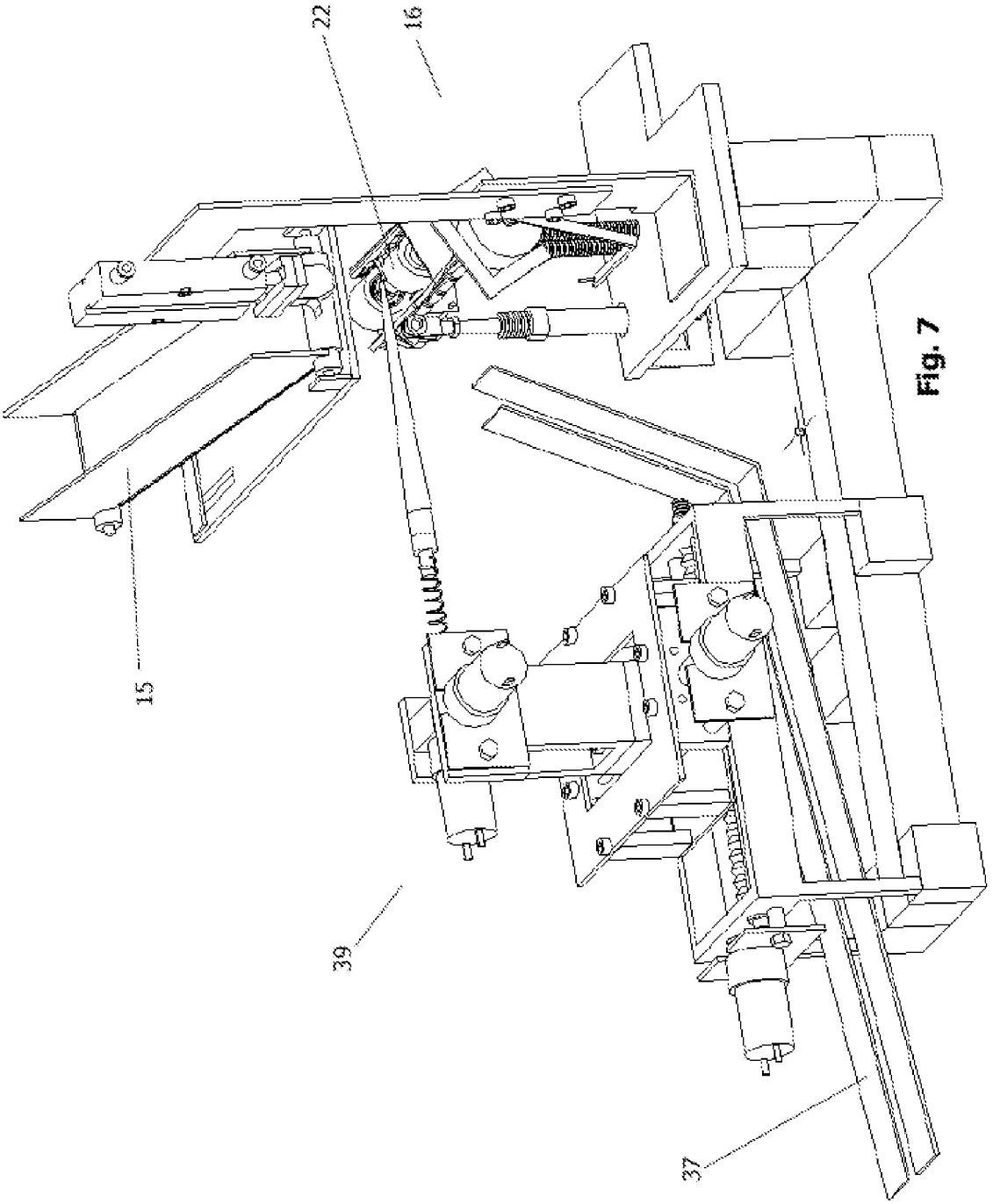


Fig. 7

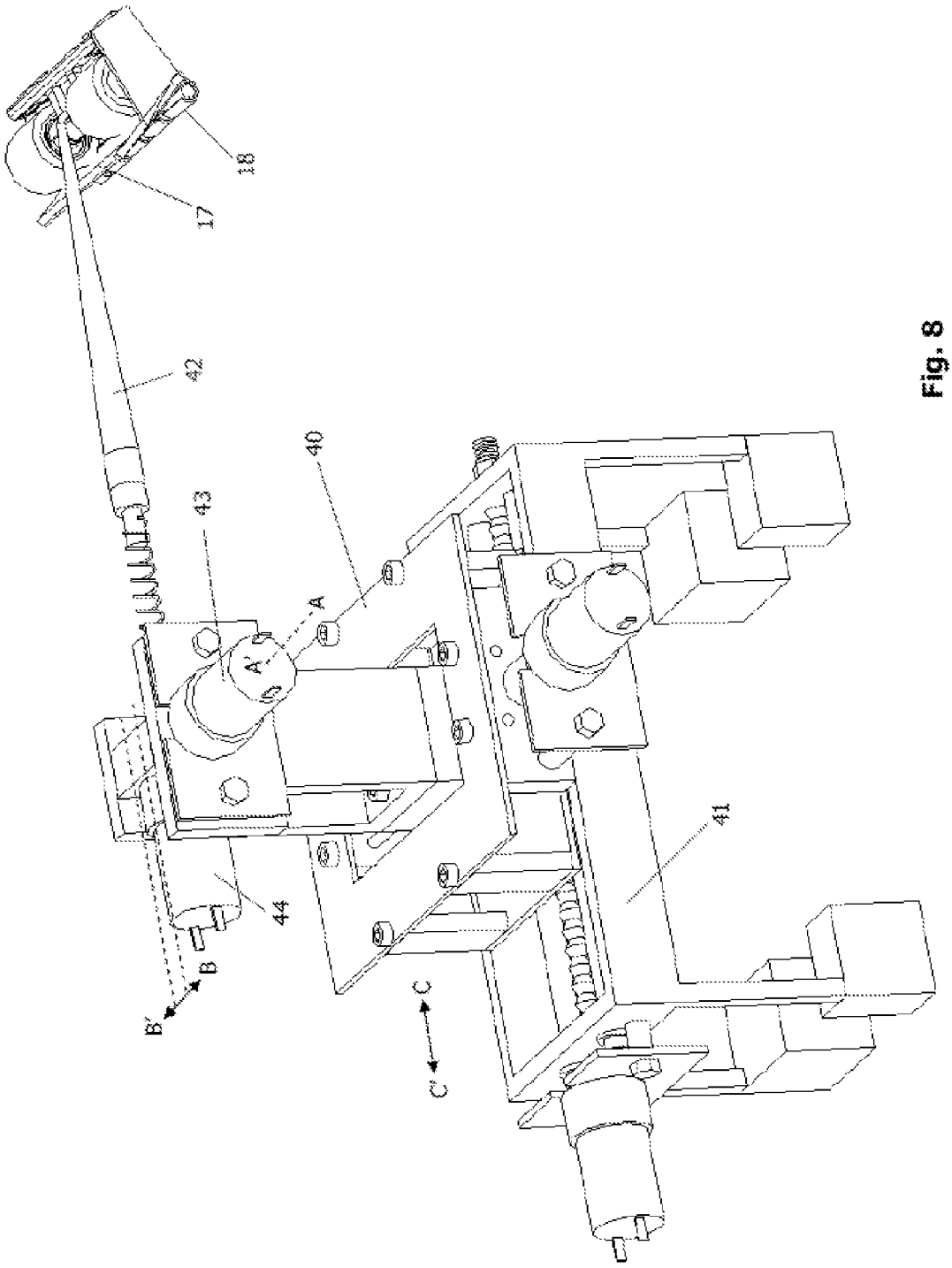


Fig. 8

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 15 7554

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y A	WO 2008/044240 A (MEVADA JITENDRA ISHWARBHAI [IN]; MISTRY NARESH AMRUTLAL [IN]) 17 April 2008 (2008-04-17) * page 18, line 21 - page 22, line 15; figure 1 *	1 2-10	INV. D01H5/80 B24B5/35 B24B19/00
Y	US 2 855 737 A (ANTHONY CHASE JOHN ET AL) 14 October 1958 (1958-10-14) * column 2, line 28 - column 4, line 25; figures 1-3 *	1	
A,D	US 3 955 336 A (FERN ROBERT W ET AL) 11 May 1976 (1976-05-11) * the whole document *	1	
A	DE 32 26 573 A1 (WOLTERS PETER [DE]) 26 January 1984 (1984-01-26) * page 5, line 3 - page 6, line 12; figure 2 *	1	
A	US 5 486 130 A (KILMER SR MARK C [US]) 23 January 1996 (1996-01-23) * claim 1; figure 3 *	1	TECHNICAL FIELDS SEARCHED (IPC) D01H B24B
A	US 4 562 669 A (BALTZER ERICH [DE] ET AL) 7 January 1986 (1986-01-07) * the whole document *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	6 October 2009	Dreyer, Claude

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 (P04C01)

4

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 15 7554

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-10-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008044240 A	17-04-2008	NONE	
US 2855737 A	14-10-1958	NONE	
US 3955336 A	11-05-1976	CA 1043309 A1	28-11-1978
DE 3226573 A1	26-01-1984	NONE	
US 5486130 A	23-01-1996	NONE	
US 4562669 A	07-01-1986	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 10040073 **[0002]**
- US 3955336 A **[0003]**