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(54) **A ROLLER CUTTER UNIT, PARTICULARLY FOR RIBBON MATERIALS**

(57) A roller cutter unit, particularly for spongy ribbon materials, characterised in that it comprises a load-bearing frame (2) equipped with support means (3) adapted to support a cutter roller (4), arranged between a first anvil roller (6) and a second anvil roller (5); said rollers (4, 5, 6) having parallel rotation axes; said cutter roller (4) being motorised and dragging said anvil rollers (5, 6) into rotation or vice versa, when a ribbon (7) is inserted between said cutter roller (4) and said anvil rollers (5, 6); said cutter roller (4) having cutting means which cut said ribbon (7) at least twice, during a first passage of the ribbon (7) between the cutter roller (4) and the first anvil roller (6), and during a second passage of the ribbon (7) between the cutter roller (4) and the second anvil roller (5); said cutting means of the cutter roller (4) being arranged on the cutter roller (4) so that during the second passage the ribbon (7) is cut for a second time, in exactly the same point as the incision during the first passage.

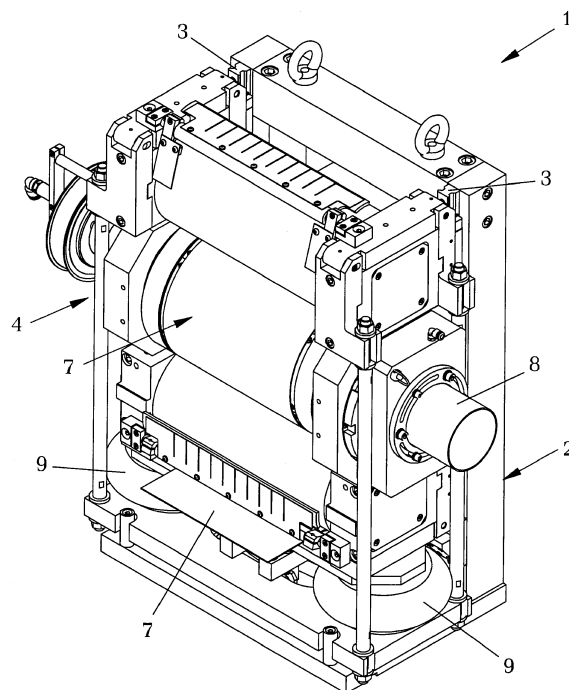


FIG. 1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a roller cutter unit, particularly for ribbon materials.

[0002] The present cutter unit is particularly designed for cutting or punching ribbon materials used for manufacturing sanitary pads, bandages and similar products.

[0003] The process for manufacturing sanitary pads comprises a step of cutting or punching the material used such as an absorbent in the product.

[0004] Said material can be of various natures and is cut substantially by two types of devices in flat presses and in roller cutter units.

[0005] In a flat press, the punch is mounted on a mobile plate which presses the material to be cut onto a fixed plate.

[0006] In a roller cutter unit, the punch is mounted on a knife roller and the ribbon material to be cut is made to pass through the knife roller, and a counter-pressure roller called anvil roller.

[0007] The roller cutter units have the advantage of being able to punch a ribbon shaped material, in a quick and continuous manner.

[0008] However, the roller cutter units do not allow particularly thick and spongy materials to be cut, such as foam materials, but are instead used for materials with a lesser thickness and deformability, such as non-woven fabrics.

[0009] In order to cut thick and spongy materials it is necessary to use presses, which do not allow for the manufacturing speeds and the continuity typical of the roller cutter units.

SUMMARY OF THE INVENTION

[0010] The task of the present invention is to implement a roller cutter unit that allows spongy and very thick materials, to be cut or punched.

[0011] Within this task, one object of the present disclosure is to implement a roller cutter unit that ensures a complete cut through the entire thickness of the material, as well as for thicker and more compliant materials, such as foam materials.

[0012] A further object of the present disclosure is to provide a cutter unit that, due to its unique implementation characteristics, is able to ensure the broadest safety and reliability guarantees in use.

[0013] These and other objects, that will be made clearer in the following, are achieved by a roller cutter unit, in particular for spongy ribbon materials, characterised in that it comprises a load-bearing frame equipped with support means adapted to support a cutter or anvil roller arranged between a first anvil or cutter roller and a second anvil or cutter roller; said rollers having parallel rotation axes; said anvil or cutter roller being motorised and dragging said anvil or cutter rollers into rotation when

a ribbon is inserted between said anvil or cutter roller and said anvil or cutter rollers; said cutter roller having cutting means that incise said ribbon at least twice, during a first passage of the ribbon between the cutter roller and the first anvil roller, and during a second passage of said ribbon between the cutter roller and the second anvil roller; said cutting means of the cutter roller being arranged on the cutter roller so that in the second passage of the ribbon, the latter is incised for a second time, in exactly the same point where the incise was carried out during the first passage of the ribbon.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Further characteristics and advantages of the object of the present invention will become clearer through an examination of the description of a preferred but non-exclusive embodiment of the present invention, illustrated by way of example and non-limitative in the annexed drawings, wherein:

Figure 1 is a perspective view of the cutter unit object of the present invention;

Figure 2 is another perspective view of the cutter unit object of the present invention;

Figure 3 is a front elevation view of the cutter unit;

Figure 4 is a plan view of the cutter unit;

Figure 5 is a side elevation view of the cutter unit;

Figure 6 is a lateral elevation schematic view, illustrating an example of the path of the ribbon being treated in the cutter unit;

Figure 7 is a lateral elevation schematic view, illustrating another example of the path of the ribbon being treated in the cutter unit;

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] With particular reference to the numeric symbols of the aforementioned figures, the cutter unit, according to the present invention, indicated overall with the reference number 1, comprises a load-bearing frame 2 equipped with support means 3 adapted to support a cutter roller 4, arranged between a first anvil roller 6 and a second anvil roller 5.

[0016] The rollers 4, 5 and 6 have parallel rotation axes.

[0017] The cutter roller 4 is motorised and drags the anvil rollers 5 and 6 into rotation when a ribbon 7 is inserted between the cutter roller 4 and the anvil rollers 5 and 6.

[0018] In the embodiment example, described and illustrated herein, reference is made to a cutter unit formed by a cutter roller and by two anvil rollers, however it is clear to the person skilled in the art that the rollers can be inverted and the unit can also be formed by a motorised anvil roller and by two cutter rollers.

[0019] The cutter roller 4 has cutting means which cut the ribbon 7 at least twice, once during a first passage

of the ribbon 7 between the cutter roller 4 and the first anvil roller 6, and again during a second passage of the ribbon 7 between the cutter roller 4 and the second anvil roller 5.

[0020] The cutting means of the cutter roller 4 are arranged on the cutter roller 4 so that during the second passage, the ribbon 7 is cut for a second time in exactly the same point where the cut was carried out during the first passage.

[0021] The cutting means of the cutter roller 4 are advantageously implemented through punch inserts, not visible in the figures, mounted on the outer surface of the cutter roller.

[0022] The punch inserts are appropriately shaped to give the desired cutting pattern and are arranged on the roller so as to carry out the second cut or incision in exactly the same position and with the same pattern as the first cut or incision.

[0023] The cutting means can also be made in monoblock depending on the various applications.

[0024] The cutter roller 4 is motorised via a motor 8 associated with the cutter roller 4 itself.

[0025] The support means 3 of the rollers 4, 5 and 6 are advantageously formed by two pairs of guides along which, the ends of the same rollers can slide, so as to adjust the distance between their axes.

[0026] The support means 3 are assisted by elastic means 9 which guarantee a correct pressure between the cylinders and the ribbon 7 to be cut or punched.

[0027] The elastic means 9 are advantageously formed by pneumatic elements, as is shown in the example in the figures.

[0028] The operation of the cutter unit 1, object of the present invention is schematically illustrated in the examples of the figures 6 and 7.

[0029] The ribbon 7 to be cut, formed by a relatively spongy material, having a thickness of up to approximately 2mm, is inserted between the first anvil roller 6 and the cutter roller 4 which, due to the action of the motor 8, is placed into rotation and drags the ribbon 7 inside the rollers.

[0030] During the first passage between the cutter roller 4 and the first anvil roller 6, the ribbon 7 undergoes a first cut or incision and is successively wound around the cutter roller 4 until it is inserted between the same cutter roller 4 and the second anvil roller 5 where the ribbon undergoes a second cut or incision that exactly overlaps the first cut or incision, completing in this manner the punching of the ribbon itself. The punched ribbon then exits from the cutter unit 1.

[0031] It has in practice been found that the present invention has reached its pre-set tasks and aims.

[0032] In fact, a roller cutter unit has been achieved, particularly designed for the continuous cutting of a ribbon shaped material with a considerable thickness and high deformability, such as spongy foam materials and the like.

[0033] The cutter unit subject of the present invention

allows a spongy foam material to be cut or punched, also with approximately 2mm in thickness, due to the second passage of the material between the same cutter roller and a second anvil roller, where the first cut is repeated exactly in the same position so as that the material is completely cut all the way through.

[0034] Naturally, the materials used, as well as their dimensions, can vary according to the need.

Claims

1. A roller cutter unit, particularly for sponge-like ribbon materials, **characterized in that** it comprises a load-bearing frame (2) equipped with support means (3) designed to support a cutter or anvil roller (4) arranged between a first anvil or cutter roller (6) and a second anvil or cutter roller (5); the rollers (4, 5, 6) have parallel axes of rotation and the cutter or anvil roller (4) is motorized and drives the anvil or cutter rollers (5, 6) in rotation when the ribbon (7) is inserted between the cutter or anvil roller (4) and the anvil or cutter rollers (5, 6); the cutter roller (4) has cutting means that incise the ribbon (7) at least twice, during a first passage of the ribbon (7) between the cutter roller (4) and the first anvil roller (6), and during a second passage of the ribbon (7) between the cutter roller (4) and the second anvil roller (5); the cutting means of the cutter roller (4) are arranged on the cutter roller (4) in such a way that in the second passage the ribbon (7) is incised a second time exactly at the same point of the incision of the first passage.
2. The cutter unit according to claim 1, **characterized in that** said cutting means of the cutter roller (4) are realized by punch inserts mounted on the outer surface of the cutter roller; said punch inserts being shaped to give the desired cutting pattern and being arranged on the roller so as to perform the second cut or incision exactly in the same position and with the same pattern as the first cut or incision.
3. The cutter unit according to claim 1, **characterized in that** said cutter roller (4) is powered by a motor (8) associated with said cutter roller (4).
4. The cutter unit according to claim 1, **characterized in that** said support means (3) of said rollers (4, 5, 6) are constituted by two pairs of guides along which the ends of said rollers (4, 5, 6) can slide so as to adjust the distance between their axes.
5. The cutter unit according to claim 1, **characterized in that** said support means (3) are assisted by elastic means (9) that ensure correct pressure between said rollers (4, 5, 6) and said ribbon (7) to be cut or punched.

6. The cutter unit according to claim 5, **characterized in that** said elastic means (9) are constituted by pneumatic elements.

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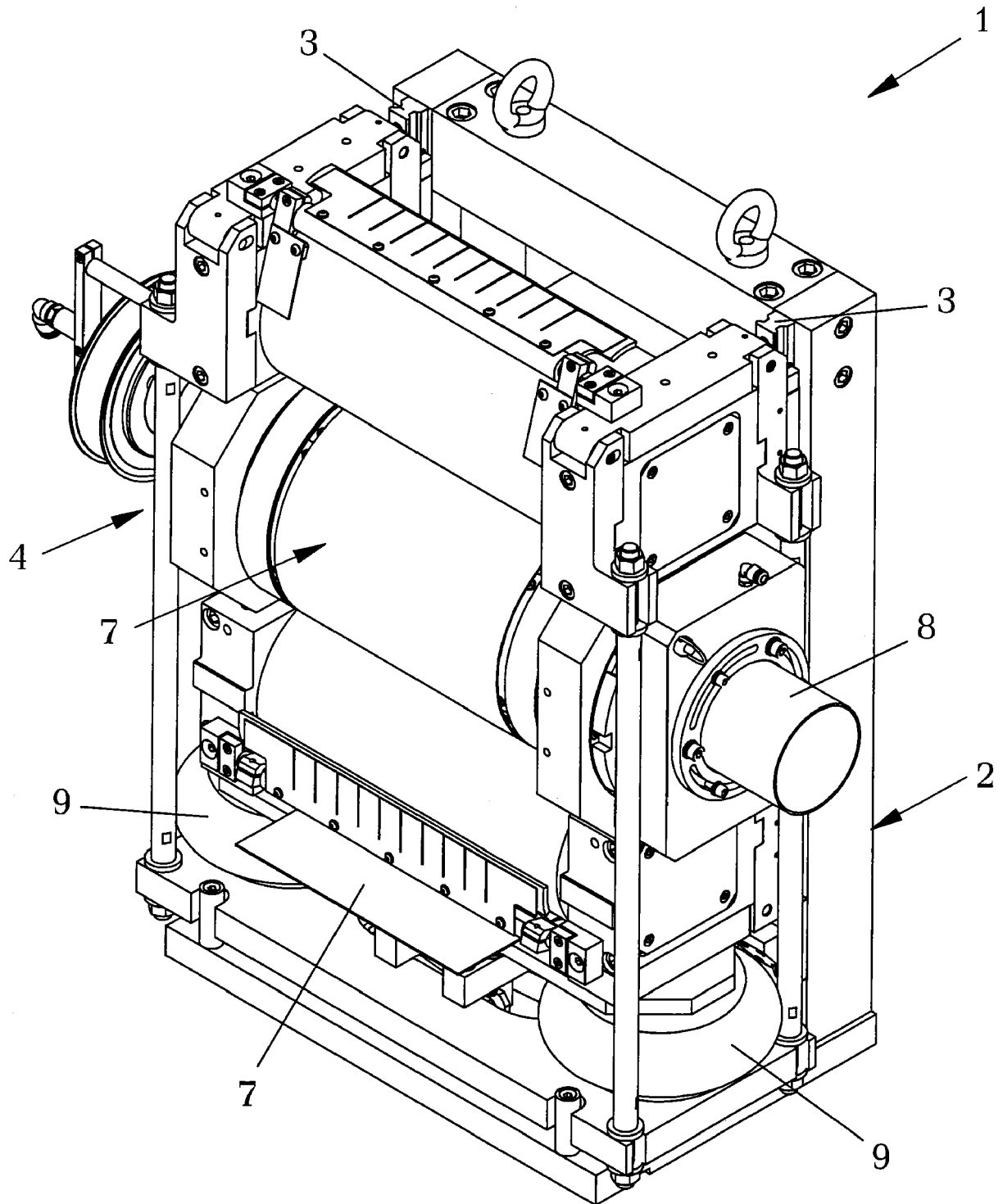


FIG. 1

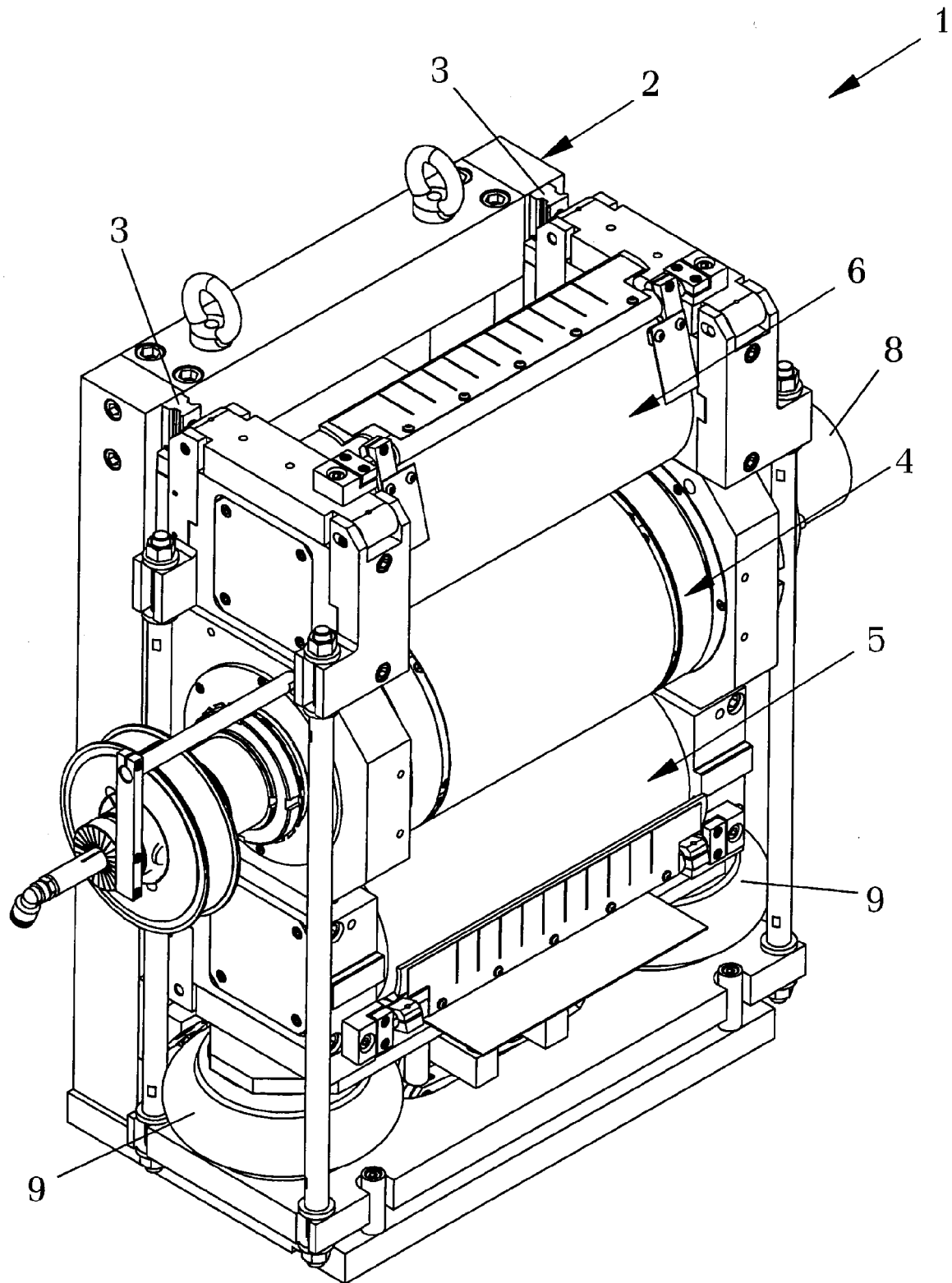


FIG.2

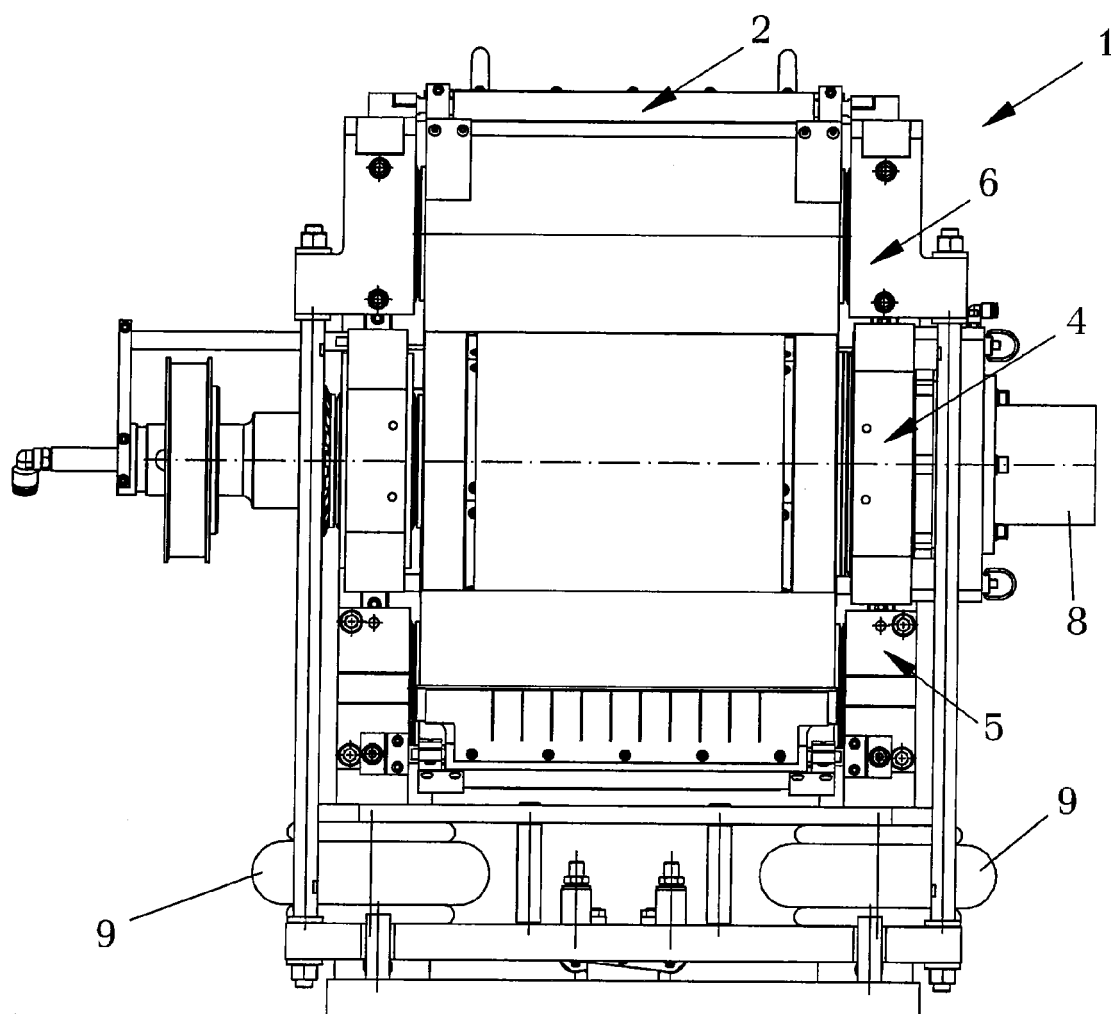


FIG. 3

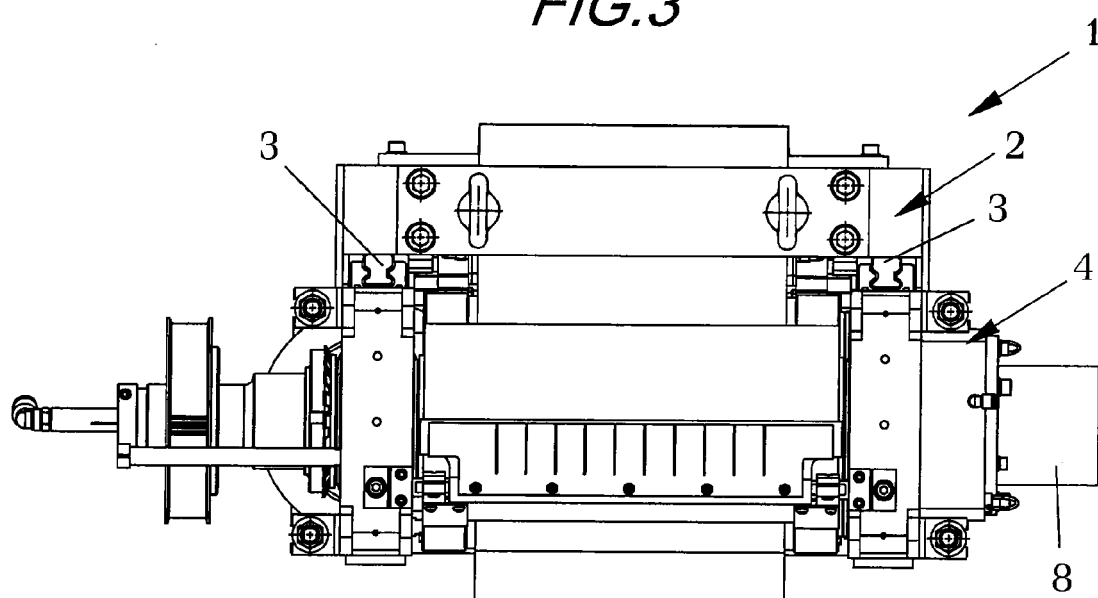


FIG. 4

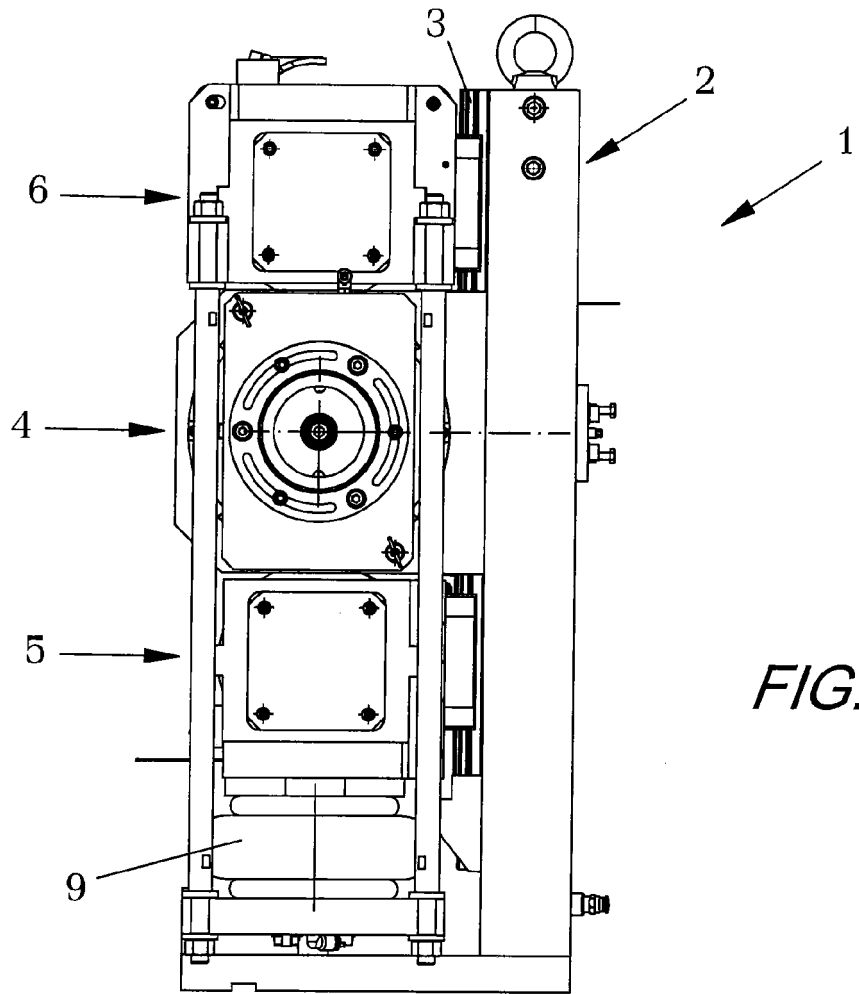


FIG. 5

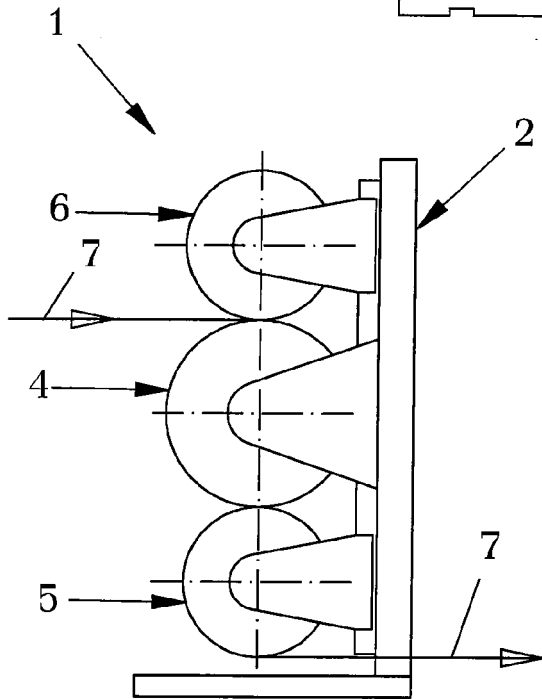


FIG. 6

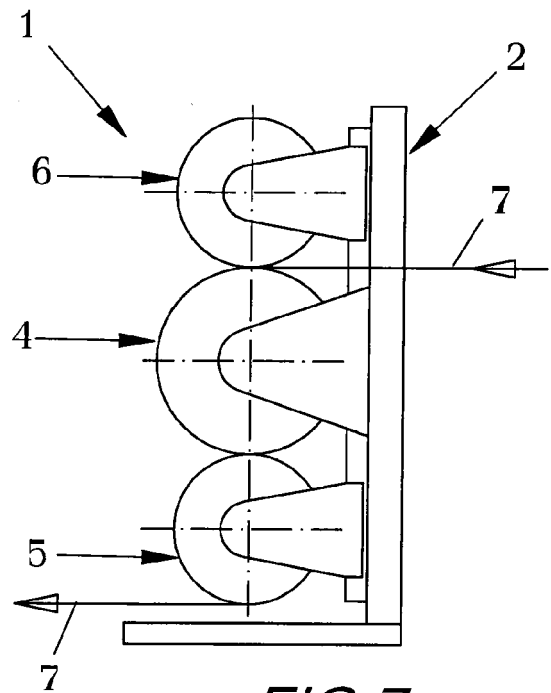


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 18 17 1151

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A	EP 3 153 285 A1 (SANDVIK INTELLECTUAL PROPERTY [SE]) 12 April 2017 (2017-04-12) * pneumatically supported rotary anvil 26; paragraph [0030] - paragraph [0041]; figures 1,2 *	1-6	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 28 September 2018	Examiner Maier, Michael
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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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
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