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(54) **An automatic machine for cutting cork sheets**

(57) The machine comprises a unit for the supply of flat, rough cork boards towards a cutting unit which comprises a counter-blade (7) for receiving the rough cork board (9), and a cutting blade (3) which is parallel to the counter-blade and slightly displaced from the plane

thereof to permit the cutting of cork sheets of controlled thickness, drive means (1,2) being provided for dragging the rough cork board towards the cutting blade and for retracting the rough cork board after a cutting operation has been performed in order to repeat the cycle until the rough cork board is finished.

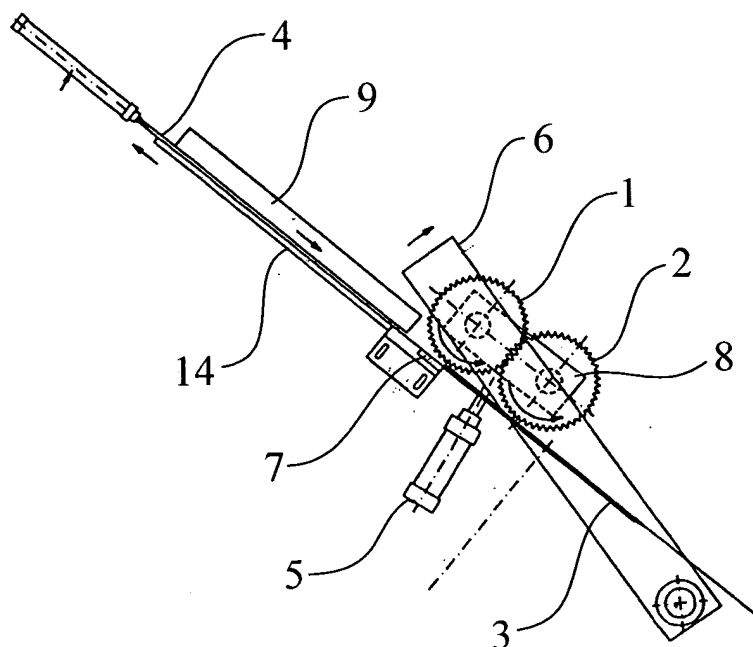


FIG. 5

Description

[0001] The present invention relates to an automatic machine for cutting cork sheets which has many advantages over the prior art.

[0002] The machine of the present invention is intended specifically for cutting natural cork boards, which are prepared beforehand by known boiling treatments that include flattening of the boards, in order to cut them into sheets of predetermined thicknesses which are intended in particular for the punching of pieces of cork such as the supplementary pieces or lower coverings of cork stoppers for bottles of sparkling wines, the bodies of which stoppers are generally made of cork composition, or for other applications.

[0003] At the moment, the work of cutting natural cork boards into sheets in order to perform the punching is carried out by semi-manual methods by means of disk saws and manual application of the cork board in order to obtain successively the various sheets for punching. It is a slow and very dangerous work, which frequently results in accidents.

[0004] The machine which is intended to carry out the automatic work of cutting natural cork boards into sheets for punching solves the above-mentioned problems and permits very quick and regular cutting of the cork sheets without any danger to the personnel attending to the work. Moreover, the increase in productivity which is achieved is extraordinarily high, which represents a very important advantage in the cost price of the pieces produced.

[0005] Basically, the machine of the present invention is

characterized in that it has a processing unit constituted by a ramp for the supply of the rough cork pieces and a cutting unit which comprises a first drive wheel or set of disks, which drags the rough piece of cork along, causing it to be arranged with pressure over a counter-blade and dragging the piece of cork towards a circular cutter which is in a parallel arrangement relative to the counter-blade, thus enabling the individual cork sheets to be cut. Upon completion of the cutting operation, a second wheel or set of disks which rotates in the opposite direction, that is, in reverse, brings about upward movement of the natural cork board which, in the intermediate processing stage, is situated towards the upper portion again to permit a new cycle of falling by gravity and cutting of a new gauged cork sheet; the process continues until the natural cork board previously supplied is finished, after which a new board is introduced from a feeder device which is situated in the upper portion of the machine and supplies the natural cork boards by gravity, one by one. The laminar cork elements that are produced in the machine are transported by conventional means to subsequent work stages or for despatch.

[0006] The set of the two wheels or sets of disks, that is, both that for dragging the natural cork board along and that for retracting it, are preferably toothed and are

mounted on a first pivoting arm on which a second arm carrying the second drive wheel or set of disks is articulated in turn. The pressure of the drive wheel or set of disks on the cork board is regulated by means of a pneumatic cylinder which acts in an adjustable manner on the pivoting unit carrying the said wheel.

[0007] For a better understanding, some drawings of an embodiment of the present invention are appended by way of non-limiting example.

[0008] Figure 1 shows schematically the arrangement of means of the machine of the present invention.

[0009] Figure 2 shows schematically a plan view of the operating unit of the machine.

[0010] Figures 3 and 4 show respective perspective views of the operation to cut a sheet from a natural cork board.

[0011] Figures 5, 6, 7, 8 and 9 show schematically respective views of the various operating stages of the cycle of the machine.

[0012] The machine comprises a main operating unit or cutting unit which is shown in detail in the drawings, in which it can be seen that it is composed basically of a first drive wheel or set of disks 1 for dragging along a natural cork board 9 for the cutting thereof between a counter-blade 7 and a cutting disk 3. The drive wheel 1 is mounted on a pivoting arm 6, on which a wheel or set of toothed disks 2 for retracting the cork board is mounted by means of a second articulated arm 8.

[0013] As will be appreciated, for the machine unit shown in Figure 1, the irregular natural cork boards or strips are supplied one by one, by means of a laterally guided track, from a supply feeder 10, which is situated in the upper portion of the machine to permit supply by gravity; the cork boards fall by gravity as far as the toothed wheel 1 which, as will be appreciated from Figure 2, preferably comprises a plurality of disks arranged in parallel on a common axle, rotating in the direction shown by the arrow and others in the figures. When the wheel or toothed disks 1 establish contact with the cork board, the arm 6 is lifted in accordance with the thickness of the board and presses the board against the counter-blade 7, dragging the board along towards the cutting disk 3 which starts to cut the rough cork board 12; as the wheel or set of disks 1 rotates in the direction of the arrow 11, it will supply the cork board in order for the cutter 3 to cut sheets up to the end of the rough cork board. When the rough cork board for cutting has passed, the arm 6 will drop and a detector will give a signal to the wheels 1 and 2 in order for them to change the direction of rotation to that indicated 13 and 13' in Figure 4.

[0014] As can be seen, the purpose of the disk 2 is to hold and take up the rough cork board since the wheel unit 1 will have lost contact with it, as will be appreciated from Figure 8; at the same time as the detector will give the signal for the change of direction of the wheels, it will also give a signal in order to bring about forward movement of a spatula 4 which slides on the rear base

14 which is coplanar with the counter-blade 7. The function of the spatula 4 is to eject the cork sheet which has just been cut, preventing it from remaining between the cutter and the counter-blade, in order to facilitate the return of the rough cork board, avoiding the ledge of some 6 mm existing between the cutter and the counter-blade.

[0015] Upon the change in the direction of rotation, the set of disks 2 will change to the direction indicated 13' which will force the cork board which is being processed to be retracted; the wheel or set of disks 1 itself, which rotates in the direction 13, then takes hold of the board again, upon which the arm 6 is lifted again; when the cork board has moved to the initial position, the arm 6 drops again and the detector gives a signal in order for the wheels 1 and 2 to change the direction of rotation 11 and 11' again; the spatula 4 is retracted, leaving the cutting zone free for a new process.

[0016] The operating process continues until the whole of the rough cork board has been cut into sheets.

[0017] Once the cork board is finished, another rough board is moved from the upper loader and the sheet-cutting process is repeated.

[0018] A pneumatic cylinder 5 acts on the pivoting unit, varying the pressure of the wheel or set of disks 1 on the cutter and the counter-blade.

[0019] The cut cork sheets will go on to subsequent steps, for example, to a system of conveyor belts 15, 15', for their input to a subsequent step of stacking in a unit 16 or to another operating step combined with the cutting of the cork sheets.

Claims

1. An automatic machine for cutting cork sheets, **characterized in that** it comprises a unit for the supply of flat, rough cork boards towards a cutting unit which comprises a counter-blade for receiving the rough cork board, and a cutting blade which is parallel to the counter-blade and is slightly displaced from the plane thereof to permit the cutting of cork sheets of controlled thickness, drive means being provided for dragging the rough cork board towards the cutting blade and for retracting the rough cork board after a cutting operation has been performed in order to repeat the cycle until the rough cork board is finished.

2. An automatic machine for cutting cork sheets according to Claim 1, **characterized in that** the drive means for dragging the rough cork board towards the cutting blade and for retracting the rough cork board are constituted by a first motor-driven wheel or set of disks which can rotate in one direction and in the other direction and is mounted rotatably on a pivoting arm, enabling its action of advancing or retracting the rough cork board to be performed, upon actuation in one direction of rotation or the other, on

the upper face of the said rough cork board, and which is combined with a second wheel or set of disks which is arranged downstream of the first, and are rotatable in the same direction as the first set of disks, and which are mounted in turn on a second pivoting arm.

3. An automatic machine for cutting cork sheets according to Claim 2, **characterized in that** the second set of drive disks is mounted on an arm pivoting on the axis of rotation of the first set of drive disks.

4. An automatic machine for cutting cork sheets according to Claim 1, **characterized in that** the cutting blade is constituted by a cutting disk arranged parallel with the counter-blade.

5. An automatic machine for cutting cork sheets according to Claim 1, **characterized by** means for ejecting the cork sheets which have been cut from the natural cork board, the ejecting means consisting of a sliding laminar plate which can move to and fro in order to eject the cork sheet which has just been cut, subsequently returning to its rest position.

6. An automatic machine for cutting cork sheets according to Claim 1, **characterized in that** it comprises a cylinder actuated by a fluid under pressure, for exerting an adjustable force on the set of drive disks.

7. An automatic machine for cutting cork sheets according to Claim 1, **characterized in that** the guide for the supply of the rough cork boards is arranged at a predetermined inclination to the horizontal to permit the supply of the rough cork boards by gravity.

8. An automatic machine for cutting cork sheets according to Claim 1, **characterized by** the provision of a feeder which is situated at the start of the ramp for the supply of the rough cork boards, to enable the rough cork boards deposited in the feeder to be supplied one by one.

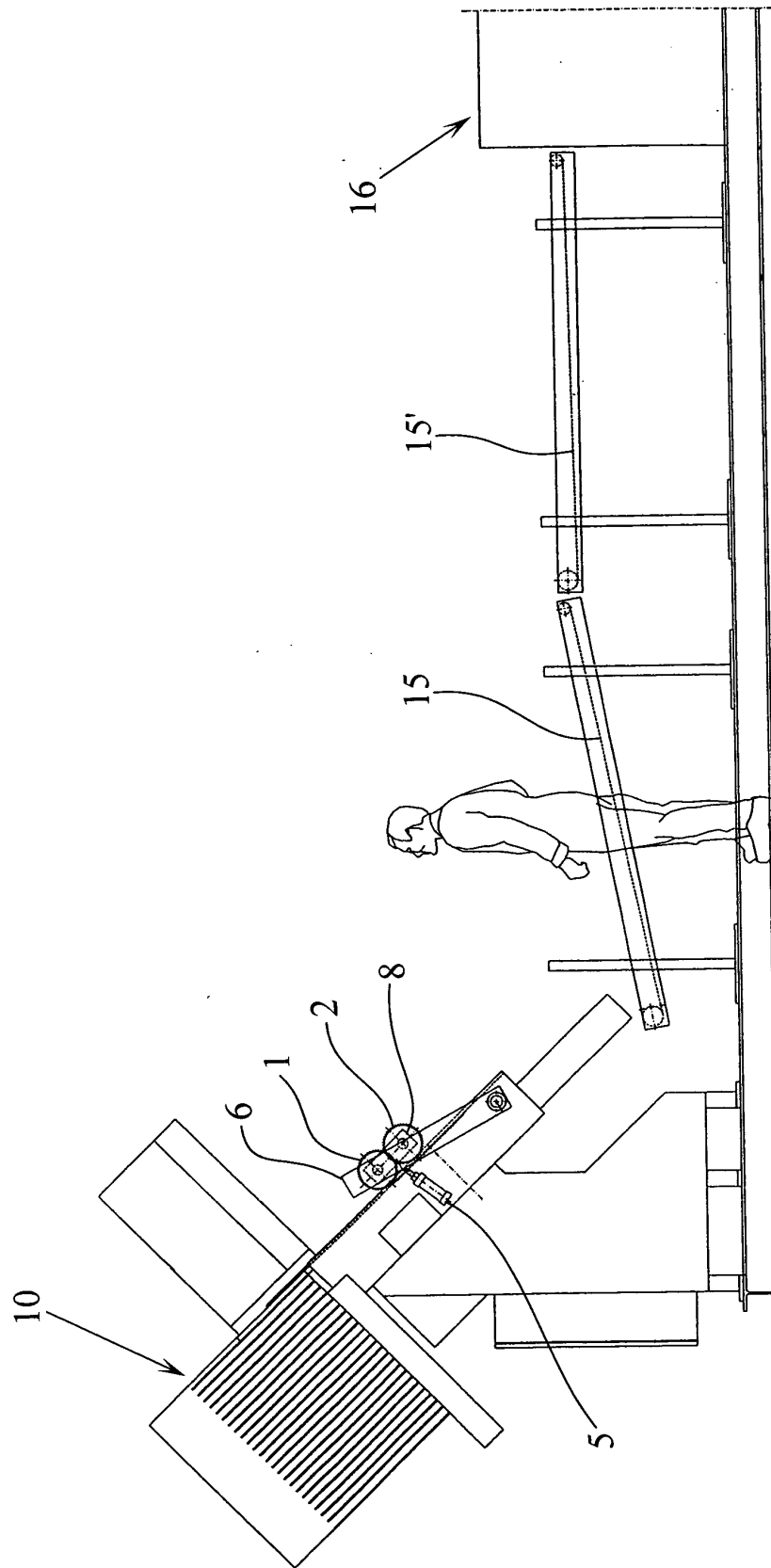


FIG. 1

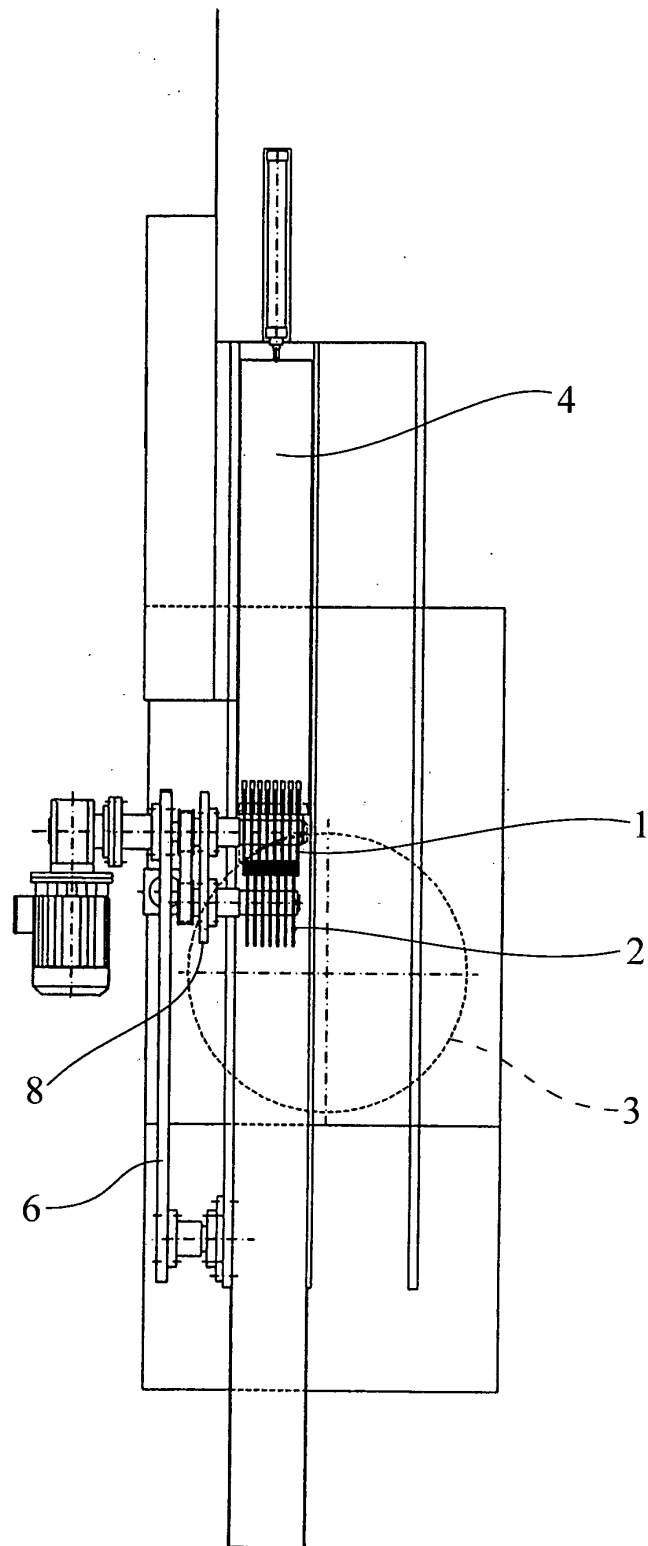


FIG. 2

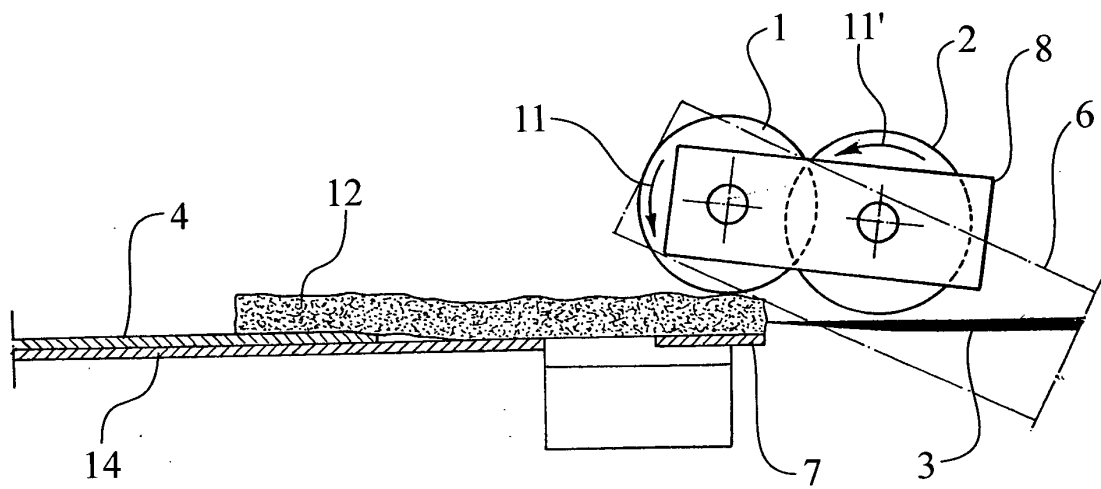


FIG. 3

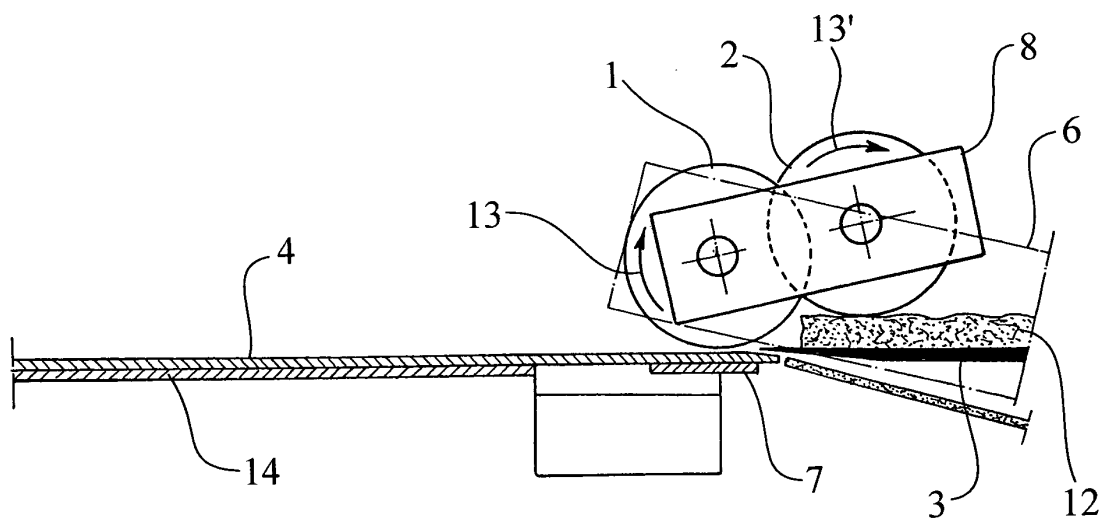


FIG. 4

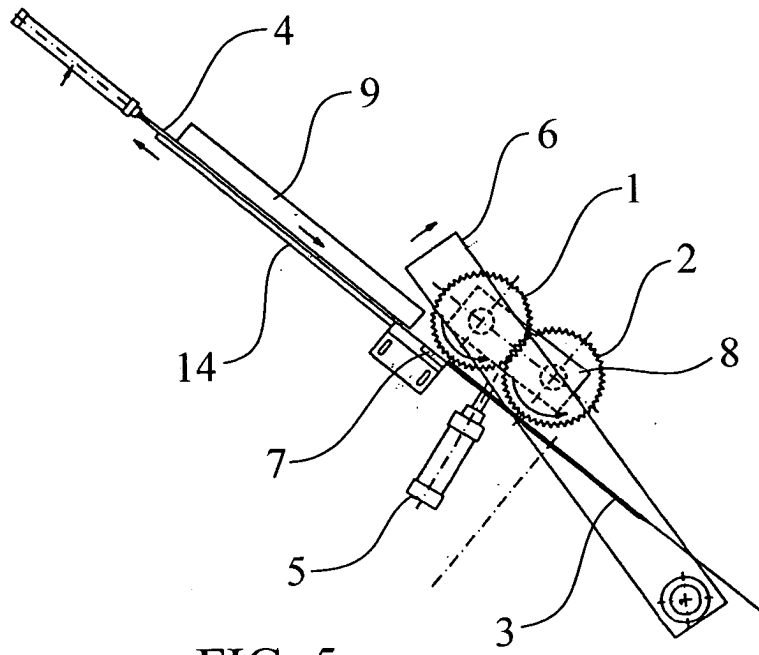


FIG. 5

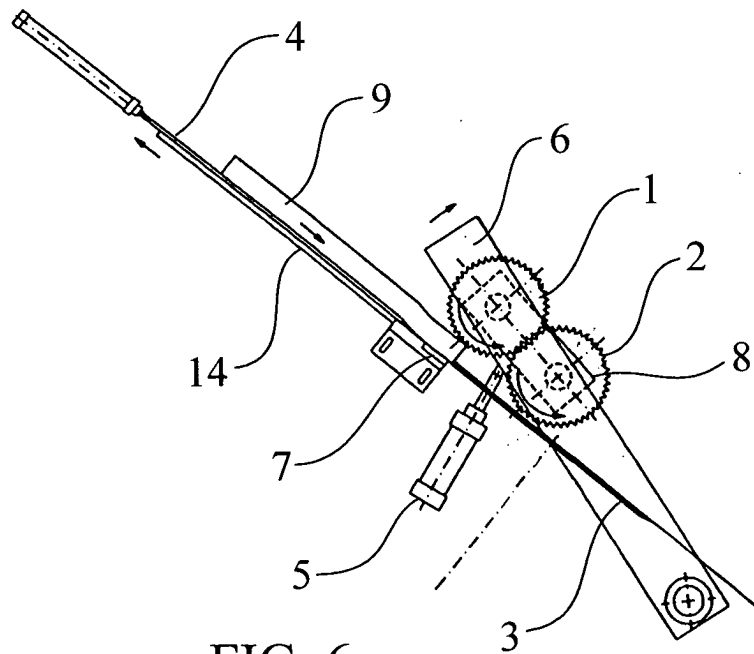


FIG. 6

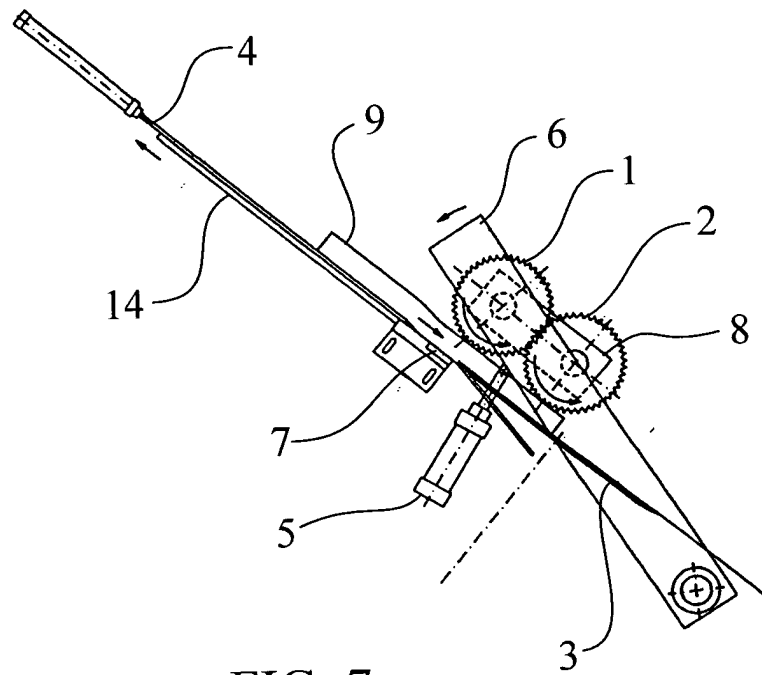


FIG. 7

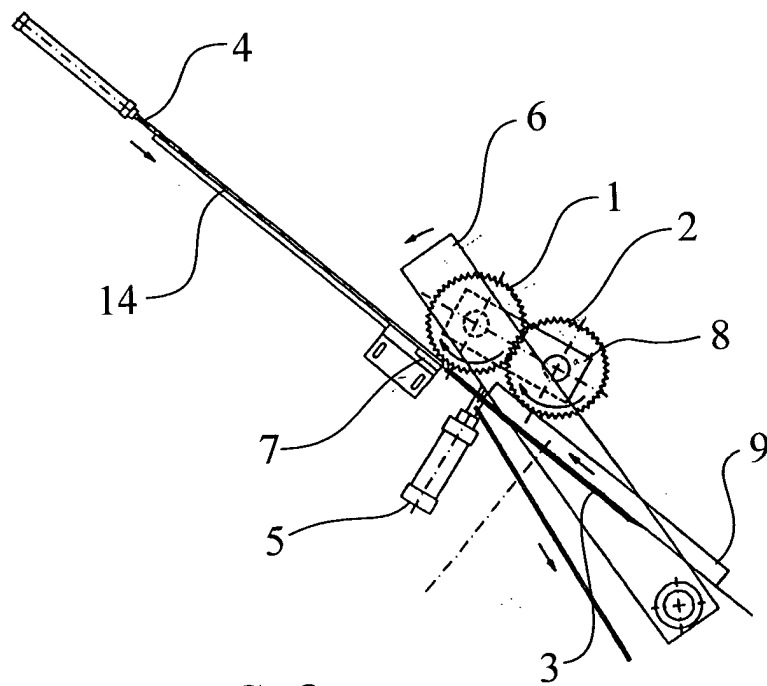


FIG. 8

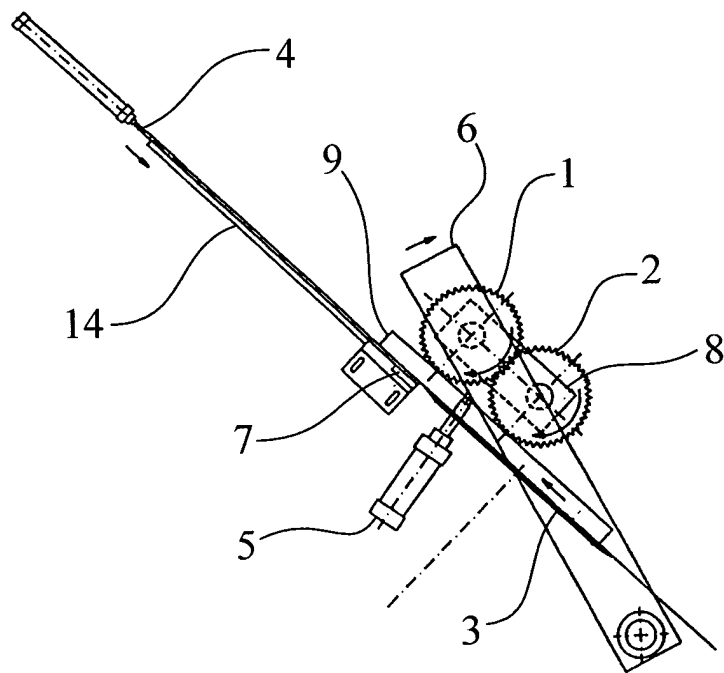


FIG. 9



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 38 0141

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.7)
X	US 2 670 771 A (YOHN HENRY M ET AL) 2 March 1954 (1954-03-02) * column 1, line 54 - column 2, line 2 * * column 2, line 46 - column 3, line 24 * * column 9, lines 52-59 * * figures 1-3,6 *	1	B27J5/00
X	FR 1 576 628 A (VENTURINI V) 1 August 1969 (1969-08-01) * page 1, lines 1-10; figures * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B27J B26D B27L B27B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 September 2004	Examiner Meritano, L
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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EP 04 38 0141

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The members are as contained in the European Patent Office EDP file on
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27-09-2004

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