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(72) Inventor: **Bastianello, Giovanni**

36050 Montorso Vicentino (Vicenza) (IT)

(74) Representative: **Bettello, Pietro, Dott. Ing. et al**

Via Col d'Echele, 25

36100 Vicenza (IT)

(71) Applicant: **Officine B.M. S.r.l.**

36050 Montorso Vicentino (Vicenza) (IT)

(54) **Device for locking a block or tiles of marble, granite or other stone materials, arranged on horizontal or hanging frames, during cutting**

(57) A device for locking a block (1) or tiles (2) of marble, granite or another stone material arranged on a horizontal and hanging frame, during cutting. Such a

device is characterised in that it comprises a plurality of combs (7) arranged above the block (1) or tiles (2), the teeth of which consist of mobile plates which function as presser elements (8).

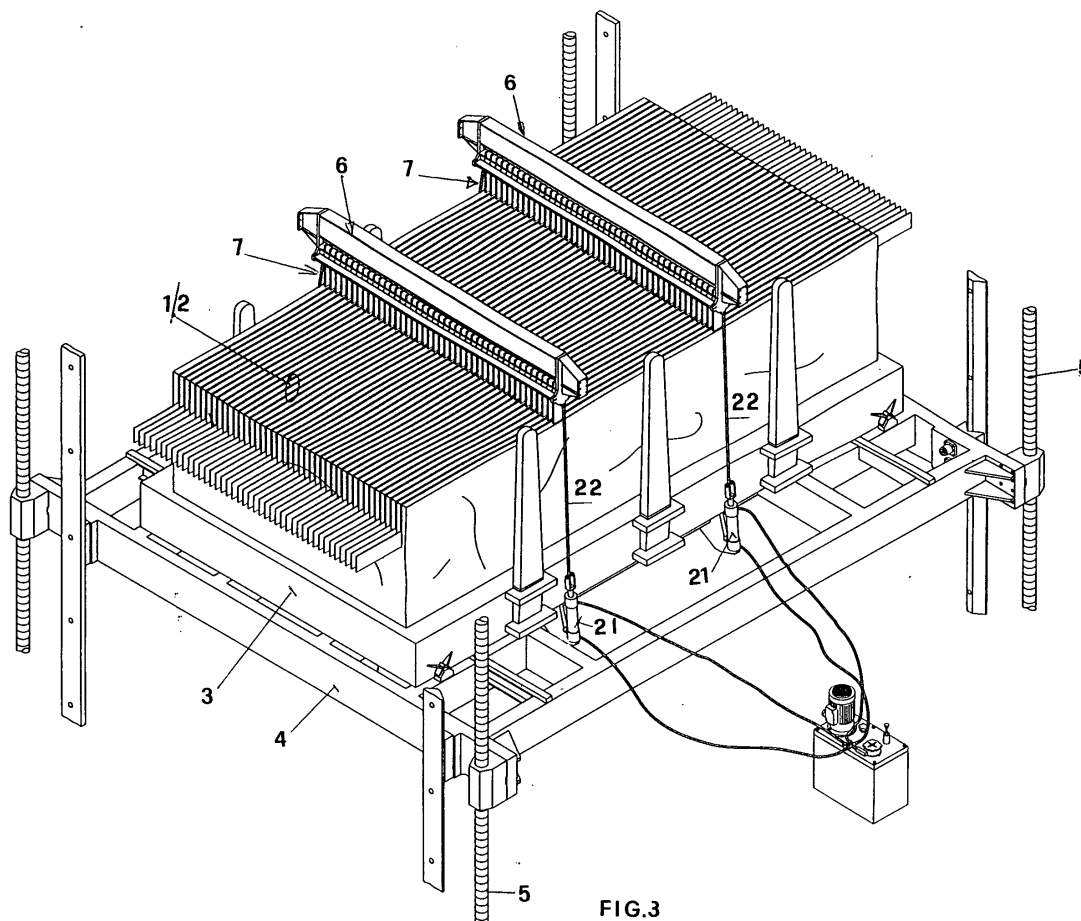


FIG.3

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Description

[0001] The present finding has the purpose of realising a device for locking a blank or tiles of marble, granite or another stone material arranged on a horizontal and hanging frame, during a cutting operation.

[0002] For some time it has been known to use multi-blade frames for cutting blocks of marble, granite and the like, some of which have been the object of patents filed by the same current applicant (see applications nos. VI93A000153, VI94A000051, VI94A000176 and VI95A00017).

[0003] As an improvement to multiblade frames of this type, with the present finding it is foreseen to realise a device for locking a blank or tiles during a cutting operation.

[0004] Such a device substantially consists of a plurality of combs arranged above the blank or tiles being cut, the teeth of which consist of mobile plates which, function as pressers, pressing uniformly on the upper surface of the blank or of each individual tile, even if said surfaces are not perfectly flat.

[0005] The pressure action applied by each individual plate or presser is adjusted by small pistons commanded oleodynamically, present in a number equal to the number of the aforementioned pressers.

[0006] Moreover, the plates or pressers which constitute the teeth of the comb are able to displace vertically in an independent manner to adapt to the irregularities of the surface of the blank or of the tiles.

[0007] Each of said combs is housed inside a collector with an oil chamber and said chambers communicate with each other and are fed by a single circuit equipped with a pump and pressure compensator, so as to balance the pressure on the individual pressers.

[0008] Said collectors are mounted on beams in turn supported and capable of sliding upon columns, fixed on the side mounts of the machine, so as to be able to be positioned precisely above the blank to be cut or the tiles, as well as so as to be able to be lifted together with the block itself, with the trolley which carries said block and with the platform upon which said trolley is rested, the whole thing being lifted through four screws arranged at the sides of the machine.

[0009] Finally, the mutual locking between the trolley, the blank of marble and the presser combs on the platform is realised through hydraulic hammers integral with the platform itself and connected, through cables, to the beams which carry the collectors with the presser combs.

[0010] The finding shall now be described in greater detail, for illustrating and not limiting purposes, with the help of the attached tables of drawings, where:

- fig. 1 (Tav. I) represents a multiblade frame in a schematic perspective view equipped with the device according to the finding;

- fig. 2 represents a detailed section view of the connection between the comb-carrying beam and its support column;

- 5 - fig. 3 (Tav. II) represents a schematic perspective view of the group of the mobile platform;

- fig. 4 (Tav. III) represents a perspective view of the group of the beam with the pressers;

- 10 - fig. 5 represents an exploded schematic view of the group of fig. 4;

- 15 - fig. 6 represents a detailed section view of the oil collector equipped with small presser pistons;

- figs. 7-8 (Tav. IV) represent partial section views, in transversal and longitudinal direction respectively, of the group of fig. 4, in working condition.

[0011] As can be seen in figs. 1 and 3, on the blank 1, in the cutting step for realising the tiles and arranged on the trolley 3 in turn lifted by the platform 4, which displaces vertically through the screws 5, in its upper part two presser groups 6 are positioned, constituting the novelty of the finding, each comprising a comb 7, the teeth of which are formed by plates or pressers 8 which compress the upper surface of the blank 1, in correspondence with each individual tile 2 (see figs. 7, 8).

20 **[0012]** Each presser group 6 is guided and capable of sliding vertically on two side columns 9 fixed to the side mount 23 of the machine.

25 **[0013]** Specifically, the beam 10 which supports' the presser group 6 is guided through the idle fitting of its hub 11 on the screw 12 and is moved by the displacement of the nut 13 which screws onto the aforementioned screw 12 which functions as a motherscrew.

30 **[0014]** On each of the plates or pressers 8, arranged side by side, acts a small hydraulic piston 14 and the plurality thereof is housed in a single collector with an oil chamber 15 in turn anchored to the aforementioned side mount 10.

35 **[0015]** The two collectors with an oil chamber 15 are fed by a single oil circuit, with the pump 16 and the pressure compensator 17 inserted.

40 **[0016]** Each of the plates or pressers 8, which constitute the teeth of the comb 7, is mobile and held in guide through protruding pins 18, which slide in the loops 19, formed in correspondence on the side shoulders 20 for containing the entire set of the pressers themselves (see fig. 7).

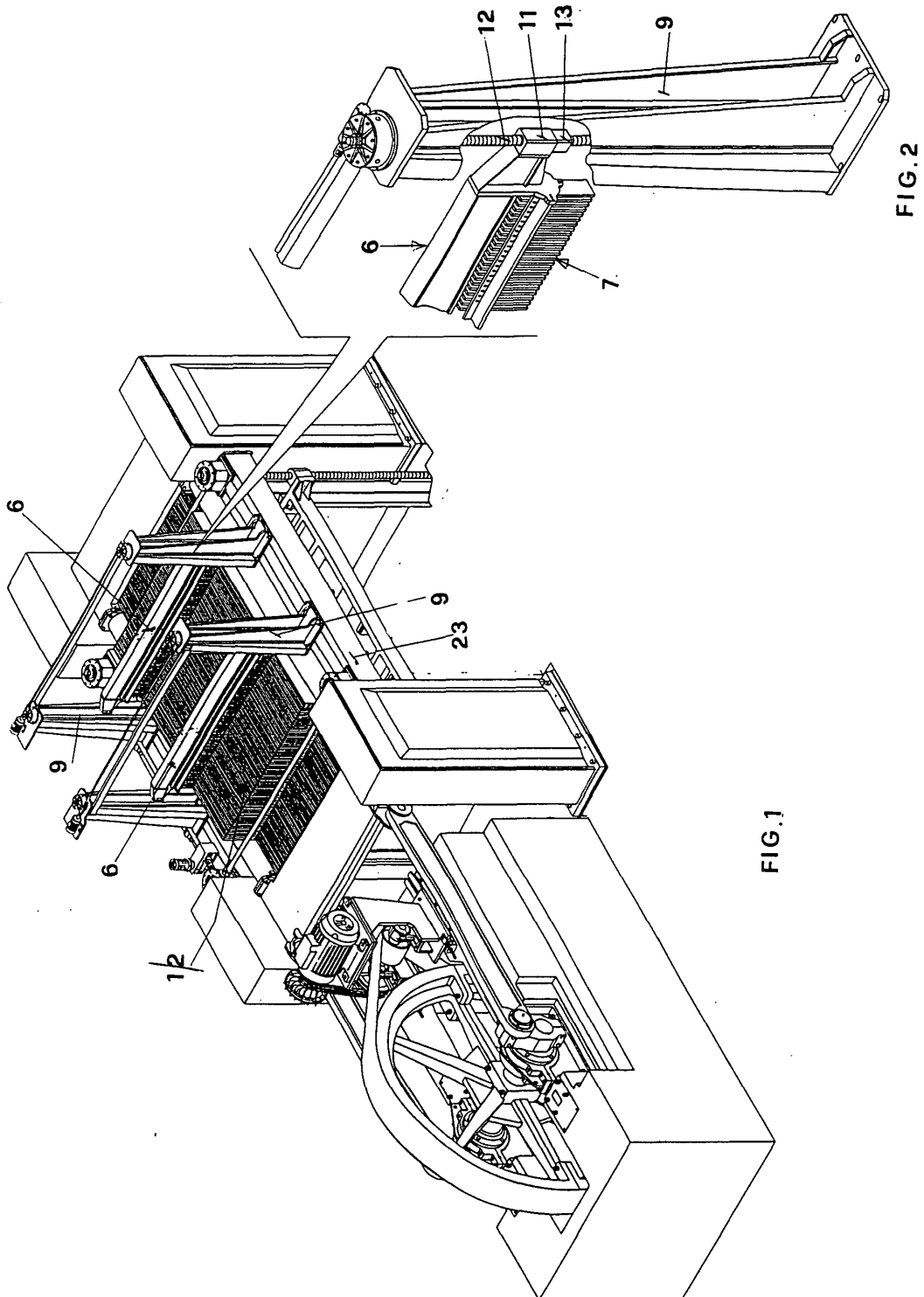
45 **[0017]** Finally, the locking of the two presser groups 6 and of the trolley 3 on the platform 4 is realised through hydraulic hammers 21 integral with the platform itself and connected, through cables 22, to the beams 10 which contain the collectors with the presser combs (see fig. 8).

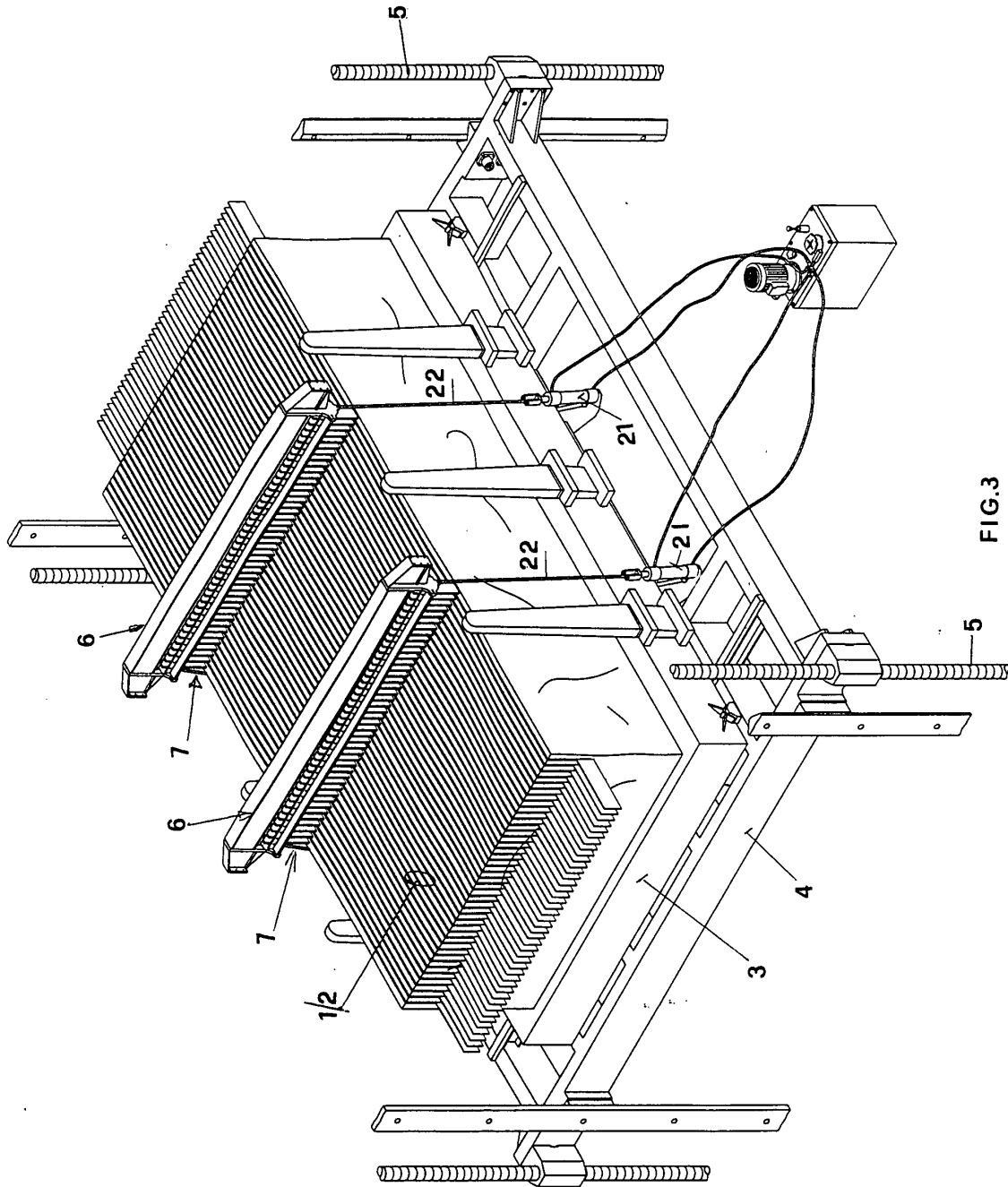
Claims

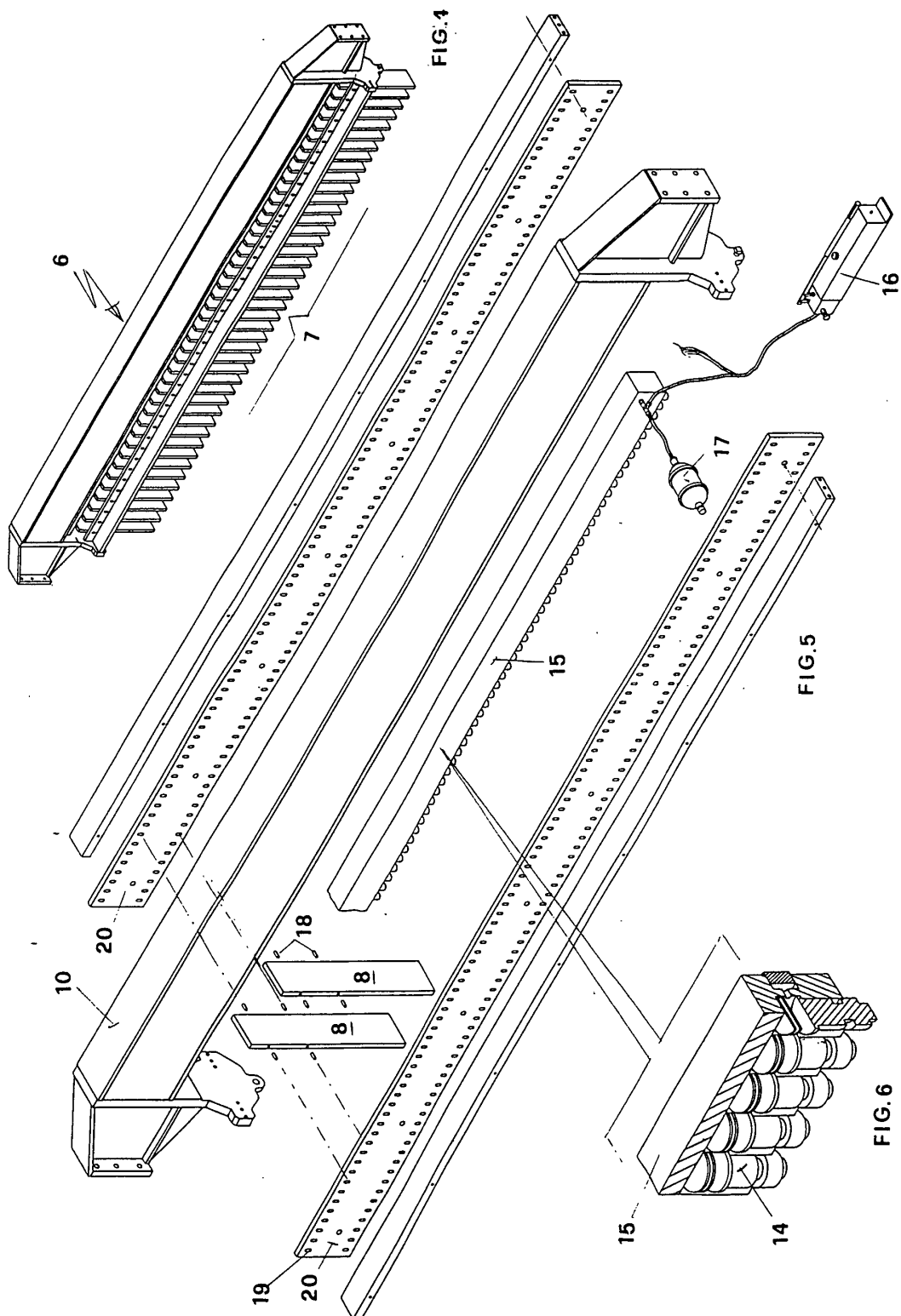
1. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, **characterised in that** it foresees a plurality of combs arranged above the blank or tiles being cut, the teeth of which consist of mobile plates which function as pressers, uniformly pressing on the upper surface of the blank or of each individual tile, even if said surfaces are not perfectly flat, the pressing action applied by each individual plate or presser being adjusted by small pistons commanded oleodynamically, present in a number equal to however many of the aforementioned pressers there are. 5
2. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claim 1, **characterised in that** the plates or pressers, which constitute the teeth of the comb, can displace vertically in an independent manner to adapt to the irregularities in the surface of the block or of the tiles. 10 20 25
3. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claims 1 and 2, **characterised in that** each of said combs is housed inside a collector with an oil chamber, said collectors being in communication with each other and fed by a single circuit equipped with a pump and a pressure compensator, so as to balance the pressure on the individual pressers. 30 35
4. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claims 1-3, **characterised in that** the collectors are mounted on beams in turn supported and capable of sliding on columns, fixed onto the side mounts of the machine, so as to be able to be positioned precisely above the blank to be cut or the tiles, as well as so as to be able to be lifted together with the blank itself, with the trolley which carries said blank and with the platform upon which said trolley rests, the whole thing being lifted through four screws arranged at the sides of the machine itself. 40 45 50
5. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claims 1-4, **characterised in that** the mutual locking between the presser combs, the block of marble and the trolley and this trolley on the platform is realised through hydraulic hammers integral with the platform itself and connected, through cables, to the beams which carry the collectors with the aforementioned presser combs. 55
6. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to one or more of the previous claims, **characterised in that**, during the cutting step, on the upper part of the blank (1), arranged on the trolley (3), in turn lifted by the platform (4) which displaces vertically through the screws (5), two presser groups (6) are positioned, each comprising a comb (7), the teeth of which are formed of plates or pressers (8) which compress the aforementioned upper surface of the blank, in correspondence with each individual tile (2). 60
7. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claim 6, **characterised in that** each presser group (6) is guided and is capable of sliding vertically on two side columns (9), fixed onto the two side mounts (23) of the machine. 65
8. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claim 7, **characterised in that** the beam (10) which forms the presser group (6) is guided through the idle fitting of its end hub (11) on the screw (12) and is moved by the displacement of the nut (13) which screws onto the screw (12) which functions as a mother screw. 70
9. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claim 7, **characterised in that** on each of the plates or pressers (8), arranged side by side, a small hydraulic piston (14) acts, the plurality of said plates or pressers being housed in a single collector with an oil chamber (15), in turn anchored to the side mount (10). 75
10. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claim 7, **characterised in that** the two collectors 80

with an oil chamber (15) are fed by a single oil circuit, in which the pump (16) and the pressure compensator (17) are inserted.

11. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claim 7, **characterised in that** each of the plates or pressers (8), which constitute the teeth of the comb (7), is mobile and is held in guide through protruding pins (18), which slide in loops (19) formed in correspondence with the side shoulders (20) for containing the entire set of the pressers themselves.
12. DEVICE FOR LOCKING A BLANK OR TILES OF MARBLE, GRANITE OR OTHER STONE MATERIALS, ARRANGED ON HORIZONTAL OR HANGING FRAMES, DURING CUTTING, according to claim 7, **characterised in that** the locking of the two presser groups (6) on the blank (1) arranged on the trolley (3) and this arranged on the platform (4) is realised through hydraulic hammers (21), integral with the platform itself and connected, through cables (22), to the side mounts (10) which contain the collectors with the presser combs.







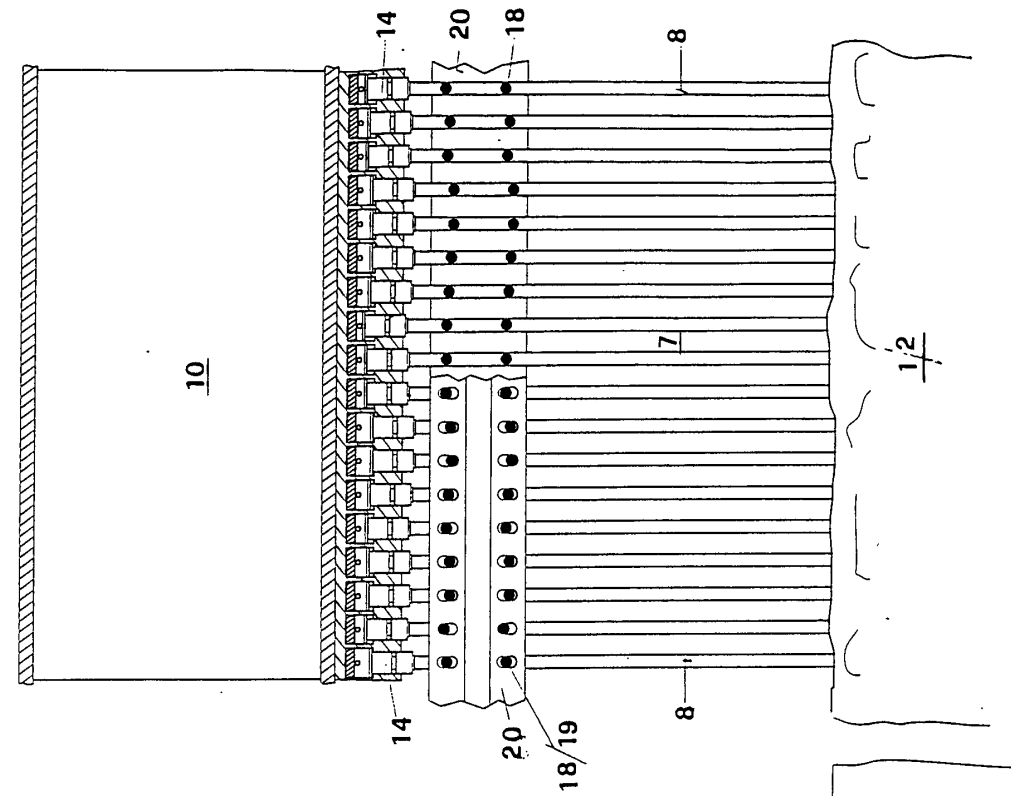


FIG. 8

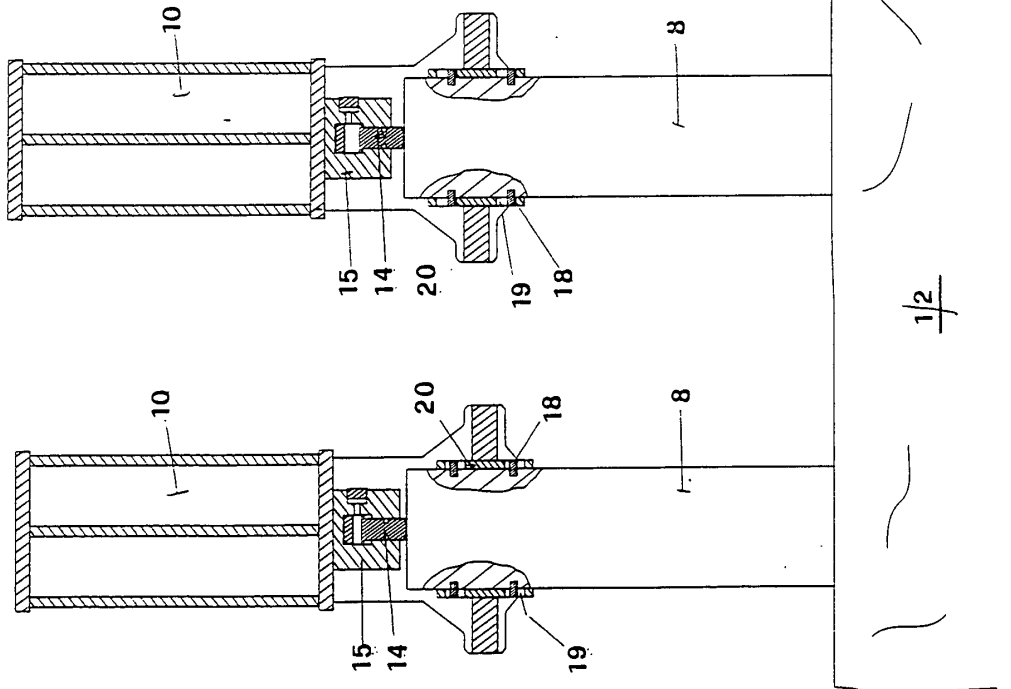


FIG. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 02 02 1710

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 2 621 645 A (STALHEIM BROR G) 16 December 1952 (1952-12-16) * column 3, line 66 - column 5, line 5 * * figures 1-3,5 *	1,2	B28D1/06 B28D7/04
A	---	3-6	
A	DE 35 16 187 A (NEUMEYER HANS) 3 October 1985 (1985-10-03) * page 4, column 29 - page 5, column 16 * * figure 1 *	1,4	
A	---		
A	DE 22 63 622 A (S N C OFFICINE MECCANICHE E FO) 6 September 1973 (1973-09-06) * page 2, line 1 - line 9 * * page 3, line 19 - line 21 * * page 5, line 25 - page 6, line 3 * * page 7, line 3 - line 30 * * figures 1-3 *	1,2	
A	---		
A	PATENT ABSTRACTS OF JAPAN vol. 007, no. 001 (M-183), 6 January 1983 (1983-01-06) -& JP 57 163016 A (TOKYO SHIBAURA DENKI KK), 7 October 1982 (1982-10-07) * abstract * * figures 3,4 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B28D
A	---		
A	DE 42 545 C (JAMES WALL MALOY) 15 June 1887 (1887-06-15) * page 1, left-hand column, line 1 - line 12 * * page 2, right-hand column, line 32 - line 36 * * figures 3,4,7 *	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 3 February 2003	Examiner Chariot, D
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
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 02 1710

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03-02-2003

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 2621645	A	16-12-1952	NONE		
DE 3516187	A	03-10-1985	DE	3516187 A1	03-10-1985
DE 2263622	A	06-09-1973	IT	949428 B	11-06-1973
			DE	2263622 A1	06-09-1973
JP 57163016	A	07-10-1982	NONE		
DE 42545	C		NONE		

EPO FORM P0459

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