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(54) **Device for transporting hides**

(57) This relates to a work group for the automatic movement and loading/unloading of hides on work surfaces of tannery machines. Such group is characterised in that it is composed of a plurality of transport belts, some of said belts being fixed and others movable. Some are subject to translation with direction and orientation equivalent to the advancing parameters of the hides, while others are subject to translation with transverse direction with respect to the aforementioned direction of the hides. Said direction, defined between the processing machine placed upstream and the processing machine placed downstream of said group, is single and rectilinear.

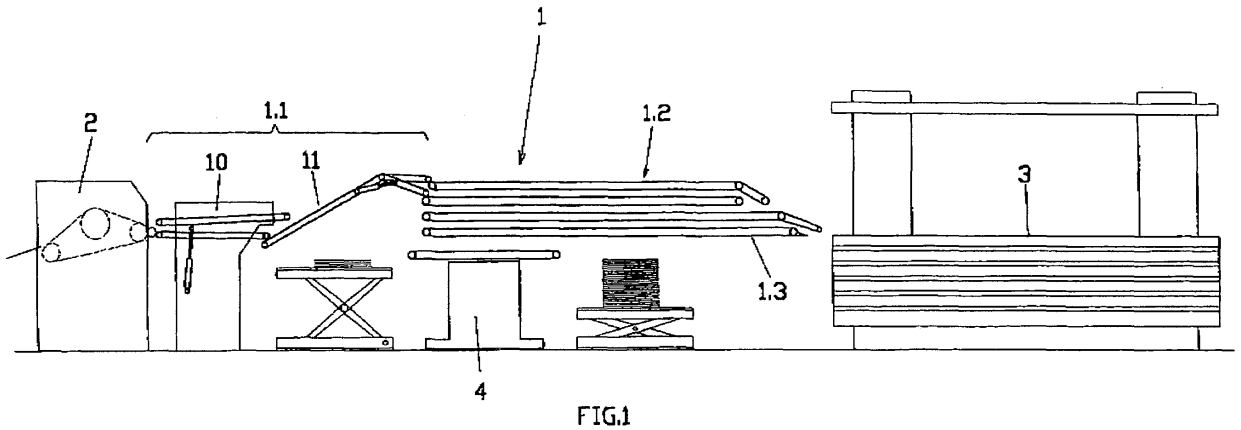


FIG.1

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## Description

**[0001]** The present finding regards a work group for the automatic movement and loading/unloading of hides on work surfaces of tannery machines.

**[0002]** As is well known to those who work in tanneries, one of the most complex operations, from the operative, economic and operator safety point of view, consists in the transfer of the hides from one processing machine, from which they leave after having undergone a processing, to a subsequent processing machine, in which they are introduced or positioned in order to undergo a subsequent processing.

**[0003]** Normally, such transfer operation of the hides occurs manually through the use of trolleys, on which the hides are deposited upon exiting the first processing machine. When they are completely loaded, the trolleys are pushed until they are positioned in proximity of the second processing machine, where the aforementioned hides are individually drawn by the workers, who insert them in the aforementioned second machine; all this requires, of course, a considerable quantity of time.

**[0004]** At the present state of the art, there have been realised more or less complex devices known by the name of "stackers" which enable and automatise the transfer operations of the hides between two consecutive processing machines.

**[0005]** Such devices have however drawbacks such as, in general, a complex construction, a considerable size and, specifically, a limited productivity (number of hides moved/hour), this slowing the work cycle; furthermore the presence of workers is always necessary to carry out the operations of loading/unloading of the hides on the processing machine placed downstream from the device.

**[0006]** Object of the present finding is to realise a device for the movement and loading/unloading of the tannery hides which lacks the drawbacks manifested by the similar devices of known type.

**[0007]** Further object of the finding is to realise a device which, in completely automatic manner and without the intervention of operators, realises:

- the transfer of the hides, exiting from a processing machine, such as a spreader/stretcher;
- the depositing of the same on a surface, such as that of a dryer or "vacuum" dryer;
- the drawing of the same after the treatment, in order to position them at a subsequent distributor device, such as a stacker, which may be of type *in* se known.

**[0008]** Further object of the finding is to realise a device of the type described above which is subject to moving hides of different dimensions, from the smallest to whole hides, always guaranteeing a high work speed.

**[0009]** Such objects are obtained with a device, indicated below with the generic term "work group", composed of a plurality of transport belts, preferably realised with sliding belts, of type *in* se known and where some of the belts are fixed while others are subject to translation, some with direction equal to and orientation corresponding with the analogous advancing parameters of the hides and others with transverse direction with respect to the aforementioned direction of the hides.

**[0010]** More specifically, the plurality of transport belts may be subdivided into three subgroups having three different functions.

**[0011]** The first subgroup, arranged immediately downstream of the processing machine from which the hides to be moved exit, has the function of receiving the extended hides and depositing them, with regularity and continuously, on the belts which make up the second transport subgroup.

**[0012]** The characteristic of this first subgroup is that of foreseeing at least two belts, placed immediately downstream of the machine, subject to sliding with transverse direction with respect to the longitudinal advancing direction of the hides.

**[0013]** In such a manner it is possible to have at least two distinct belts which, in succession, are alternatively positioned in front of the first processing machine so that, while one belt collects the hides exiting from the aforementioned machine the other belt simultaneously unloads its hides on the second subgroup, thus halving the time of such operation.

**[0014]** Such operation manner of the aforementioned first subgroup is advantageously possible with hides of small and medium dimensions, or with hides having a width which does not exceed half of the width of the transport belt, so that the same may be simultaneously moved on two rows.

**[0015]** On the other hand, when the hides to be moved are "large" hides or whole hides the belts of the aforementioned first subgroup remain fixed, mutually aligned and synchronously operating, generating therefore a single transport surface of the hides themselves.

**[0016]** The second subgroup of transport belts is fixed, i.e. its support structure does not slide lengthwise and has the function of accumulating the hides which are unloaded from the aforementioned first belt subgroup, placed upstream.

**[0017]** The third subgroup of transport belts is movable, i.e. its support structure slides lengthwise and has the function of drawing the processed hides from the surface of the second processing machine (unloading action), placed downstream and depositing the hides to be processed (loading action) on the aforementioned work surface.

**[0018]** The finding will be better defined through the description of one of its possible embodiments, given only as a non-limiting example, with the help of the attached drawing tables wherein:

- Figures 1-2 (Table I) represent the elevation and plan

views of the group according to the finding, in rest condition;

- Figures 3-4 (Table II) represent the elevation and plan views of the group in working condition;

- Figures 5A-B-C-D (Table III) represent the detail views of the zones of passage of the hides.

**[0019]** As is visible in fig.1, the work group, indicated in its entirety with the number 1, composed of a plurality of transport belts, better defined below, is positioned between a processing machine 2 placed upstream, such as a stretcher/dryer and a processing machine 3 placed downstream, such as a vacuum dryer, as well as flanked by a stacker 4 of the processed hides.

**[0020]** The work group 1 is composed of a subgroup 1.1, which receives the hides 5.1 from the processing machine 2, an intermediate subgroup 1.2, which accumulates the hides 5.2, and a subgroup 1.3, which deposits the hides 5.3 on the surface of the processing machine 3, as well as draws the processed hides 5.4 to deliver them to the stacker 4.

**[0021]** As is visible in the detail figures, the first subgroup 1.1 comprises two couples of belts 10 and 11, arranged in succession.

**[0022]** The couple placed in front comprises two belts 10.1 and 10.2 subject to transversely sliding so to bring themselves from a central position, in line with the centre line of the machine 2, to a side position and back, and a couple of belts 11.1 and 11.2, arranged side by side and fixed, which have the function of collecting the hides unloaded from corresponding belts 10.1 and 10.2 when the latter are placed laterally.

**[0023]** As inferred from the observation of the figures, when the hides 5.1 have a width such that they may not be arranged on two rows, as represented, it is sufficient to mutually align the belts 10.1 and 10.2 and make the belt couples work synchronously in order to realise a single fixed transport surface.

**[0024]** Furthermore, as is visible in fig.5B, the two rear belts 11.1 and 11.2 both end with a floating belt 11.3, which has the function of conveying the hides 5.1 on two subsequent belts 20, in alternating manner.

**[0025]** The second subgroup 1.2 comprises two transport belts 20.1 and 20.2, arranged mutually superimposed and fixed, on which the hides unloaded from the belts 11.1 and 11.2 are accumulated. When accumulation is completed, the hides, sliding on the aforementioned belts, are unloaded by gravity on the underlying subgroup 1.3.

**[0026]** Operatively, as visible in figures 5B and 5C, the upper belt 20.1 is fed from the belts 11, and when the aforementioned belt 20.1 is filled, the belt 11.3 angularly rotates, so to load the lower belt 20.2 and thus alternatively until the emptying of the belts 11.1 and 11.2.

**[0027]** Furthermore, during the loading of the second belt 20.2, the overlying belt 20.1 unloads the hides on the subsequent belt 30.1 and such operation mode proceeds alternatively.

**[0028]** As is visible in fig.5C, during the passage of the hide 5.2 from the belts 20 to the belt 30.1, the same, due to the pulling of the lower belt's sliding belts, is deposited in overturned mode, i.e. the fine part of the hide, the so-called "grain" is advantageously turned downward; this corresponds with the optimal position which the hide must assume when it is extended on the work surface of the vacuum 3.

**[0029]** The third subgroup 1.3 comprises two transport belts 30.1 and 30.2, mutually integral and superimposing.

**[0030]** The entire subgroup 1.3 is subject to sliding lengthwise until it brings itself inside and above the second processing machine 3, so that it may then carry out the actions of drawing and depositing of the hides 5.4 on the work surface of the aforementioned machine.

**[0031]** Operatively, the subgroup 1.3 operates in two steps: in the first step, as is visible in fig.5D, during the entering movement of the subgroup on the processing machine 3, there occurs the recovery of the processed hides 5.4 present on the work surface by means of the belt 30.2, while during the exit movement there occurs the deposit of new hides on the aforementioned surface, by means of the belt 30.1.

**[0032]** The second work step of the subgroup 1.3 is realised when the same has completely exited from the surface of the machine 3 and is brought back to its initial position (see fig.1).

**[0033]** In this second step there simultaneously occurs the passage of the hides 5.2 from the accumulation belts 20.1 and 20.2 to the loader transport belt 30.1, and the unloading of the hides 5.4 from the belt 30.2 and their depositing on the stacker 4.

**[0034]** As is visible in the figures, the entire work group 1, thanks to its constructive form and mode of operation, may be positioned in line between the two processing machines 2 and 3, minimising therefore the dimensions. Furthermore, it may be arranged on the smaller side of the work surface 3.1, i.e. along the longitudinal direction of the aforementioned surface so that it is possible, with only the translation movement of the subgroup 1.3, to automatically deposit and draw the hides on the entire surface, without any personnel intervention, as is on the hand required in the constructive solutions of known type.

**[0035]** From that related above, it is inferred that all of the predetermined objects have been attained with the realisation of a work group for the transport and loading/unloading of the hides, which optimises the continuous operation of the processing machines placed upstream and downstream of said group.

**[0036]** Embodiments are possible even different from that described, in relation with the employed technical elements and according to the needs, without departing from the scope of the following claims.

**Claims**

1. WORK GROUP FOR THE AUTOMATIC MOVEMENT AND LOADING/UNLOADING OF HIDES ON WORK SURFACES OF TANNERY MACHINES, **characterised in that** it is composed of a plurality of transport belts, some of said belts being fixed and other movable, some being subject to translation with direction and orientation equivalent to the advancing parameters of the hides and others being subject to translation with transverse direction with respect to the aforementioned direction of the hides and where said direction, defined between the processing machine placed upstream and the processing machine placed downstream of said group, is single and rectilinear.

2. WORK GROUP, according to claim 1, **characterised in that** the plurality of transport belts is subdivided into three subgroups having three different functions and precisely that of collecting the hides exiting from the upstream processing machine, accumulating the moved hides and loading/unloading of the hides on the downstream processing machine.

3. WORK GROUP, according to claim 2, **characterised in that** the first subgroup, arranged immediately downstream of the processing machine from which the hides to be moved exit, has the function of receiving the extended hides and depositing them, with regularity and continuously, on the belts which compose the second transport subgroup, said first subgroup foreseeing at least two belts subject to sliding with transverse direction with respect to the longitudinal advancing direction of the hides.

4. WORK GROUP, according to claim 3, **characterised in that** the two movable belts, in succession, alternatively position themselves immediately downstream of the first processing machine so that while one belt collects the hides exiting from the aforementioned machine the other belt simultaneously unloads its hides on the second subgroup.

5. WORK GROUP, according to claim 2, **characterised in that** the second subgroup of transport belts is fixed, i.e. its support structure does not slide lengthwise and has the function of accumulating the hides which are unloaded by the aforementioned first belt subgroup placed upstream and unloading the same on the third subgroup.

6. WORK GROUP, according to claim 2, **characterised in that** the third subgroup of transport belts is movable, i.e. its support structure slides lengthwise and has the function of drawing from the surface of the processing machine (unloading action) the processed hides and depositing other hides (loading action) on the aforementioned surface.

7. WORK GROUP, according to claim 1, positioned between one processing machine (2) placed upstream, such as a stretcher/dryer and a processing machine placed downstream (3), such as a vacuum dryer, as well as flanked by a stacker (4) of the processed hides, **characterised in that** it comprises a subgroup 1.1 which receives the hides 5.1 from the processing machine (2), an intermediate subgroup (1.2), which accumulates the hides and a subgroup (1.3), which draws the processed hides (5.4) from the surface of the processing machine (3) to deliver them to the stacker (4) and deposits new hides (5.3) on the aforementioned surface.

8. WORK GROUP, according to claim 7, **characterised in that** the first subgroup (1.1) comprises two couples of belts (10, 11) arranged in succession; the couple placed in front comprises two belts (10.1, 10.2) subject to move transversely so to bring themselves from a central position, in line with the centre line of the machine (2) to a side position and back, and a couple of belts (11.1, 11.2) arranged side by side and fixed, which have the function of collecting the hides unloaded by the corresponding belts (10.1, 10.2), when the latter are placed laterally.

9. WORK GROUP, according to claim 8, **characterised in that** the two rear belts (11.1, 11.2) both end with a floating belt (11.3) which has the function of conveying the hides (5.1) onto two subsequent belts (20.1, 20.2) in alternating manner, being foreseen that the belt (11.3) first deposits the hides on the subsequent upper belt (20.1) and, when the aforementioned is filled, rotating angularly, said belt deposits the hides on the subsequent lower belt (20.2) and vice versa, until the belts (11.1, 11.2) are emptied.

10. WORK GROUP, according to claim 7, **characterised in that** the second subgroup (1.2) comprises two transport belts (20.1, 20.2) arranged mutually superimposed and fixed, on which the hides unloaded from the belts (11) are accumulated, said hides, when accumulation is completed, sliding on the aforementioned belts, are unloaded by gravity on the underlying subgroup (1.3), positioning themselves with the fine part (grain) turned downward.

11. WORK GROUP, according to claim 7, **characterised in that** the third subgroup (1.3) comprises two transport belts (30.1, 30.2) mutually integral and superimposed, said subgroup being subject to sliding lengthwise until it completely brings itself above the work surface of the processing machine (3) and carrying out the actions of drawing and depositing of the hides (5.4) on the work surface of the aforemen-

tioned machine and final unloading on a stacker (4).

**12.** WORK GROUP, according to claim 11, **characterised in that** the subgroup (1.3), during the entering movement of the subgroup on the processing machine (3), realises the recovery of the processed hides (5.4) present on the work surface by means of the belt (30.2), while during the exit movement it realises the deposit of new hides on the aforementioned surface, by means of the belt (30.1).

**13.** WORK GROUP, according to claim 11, **characterised in that** when the subgroup (1.3) has completely exited from the surface of the machine (3) and is brought back to its initial position, there occurs the passage of the hides (5.2) from the accumulation belts (20.1, 20.2) to the loading transport belt (30.1) and simultaneously the unloading of the hides (5.4) from the belt (30.2) and their deposit on the stacker (4).

**14.** WORK GROUP, according to one or more of the preceding claims, **characterised in that** it is positioned in line between the two processing machines (2, 3) and arranged on the smaller side of the work surface (3), along the longitudinal direction of the aforementioned surface.

**15.** WORK GROUP, according to one or more of the preceding claims, **characterised in that** the subgroup (1.1) is subject to composing a single fixed transport surface, in which the belts (10.1, 10.2) remain mutually aligned and the belt couples (10, 11) operate synchronously, so to permit the processing of large-size hides, which cannot be arranged aligned on two rows during transport.

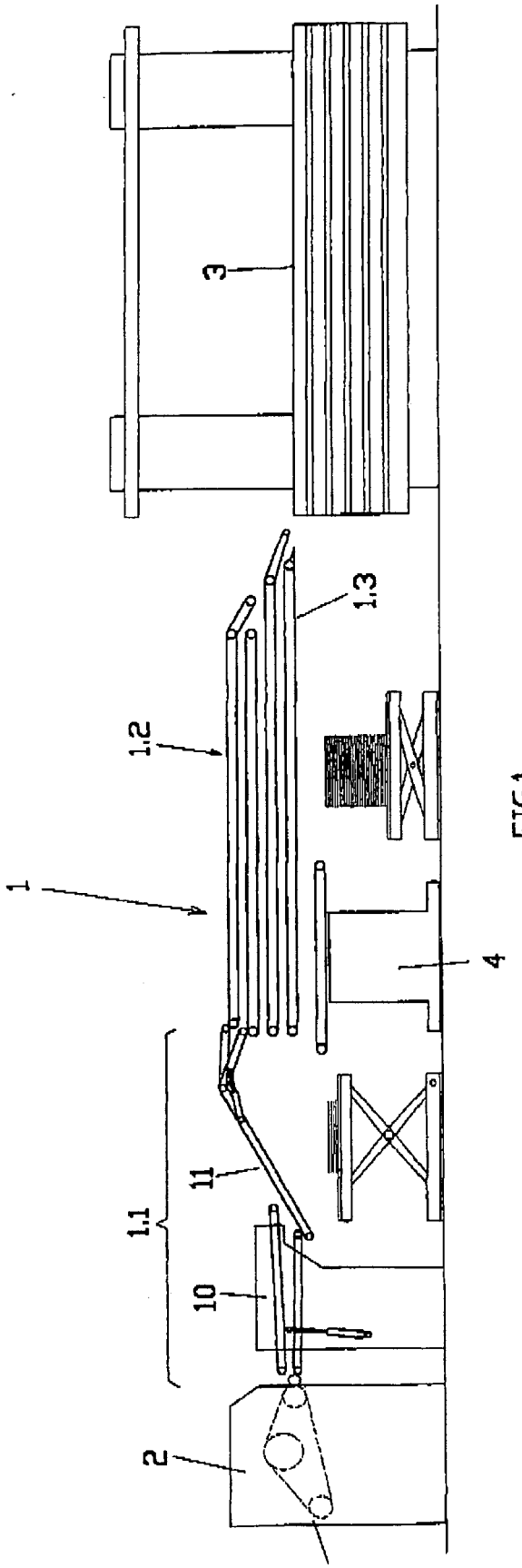



FIG.1

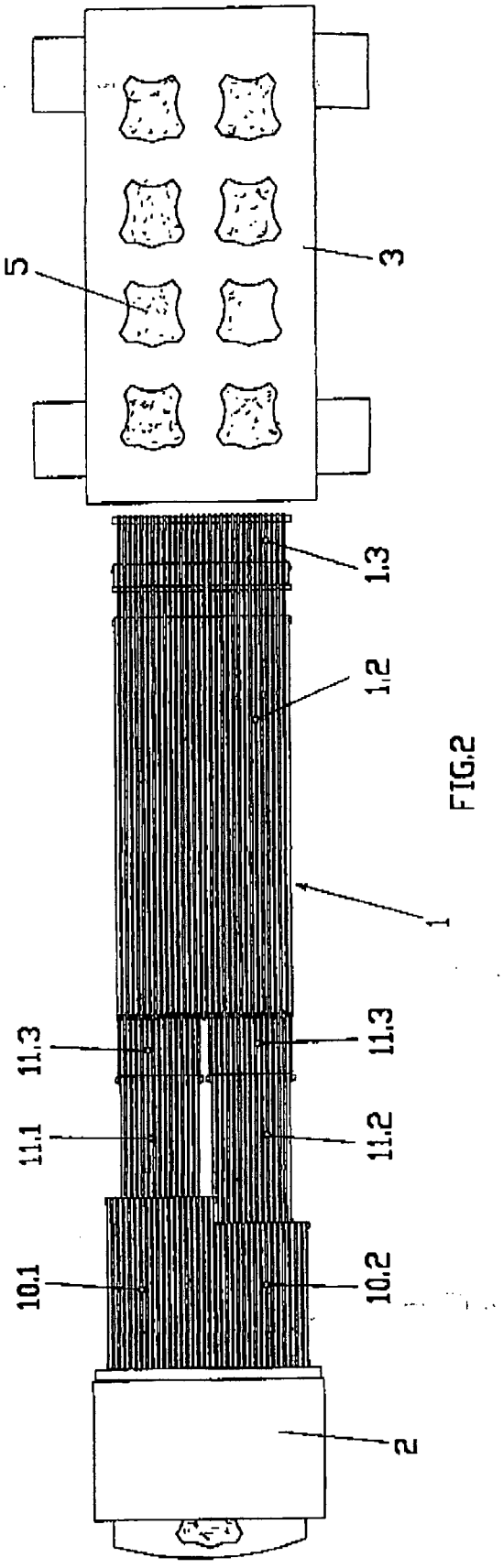



FIG.2

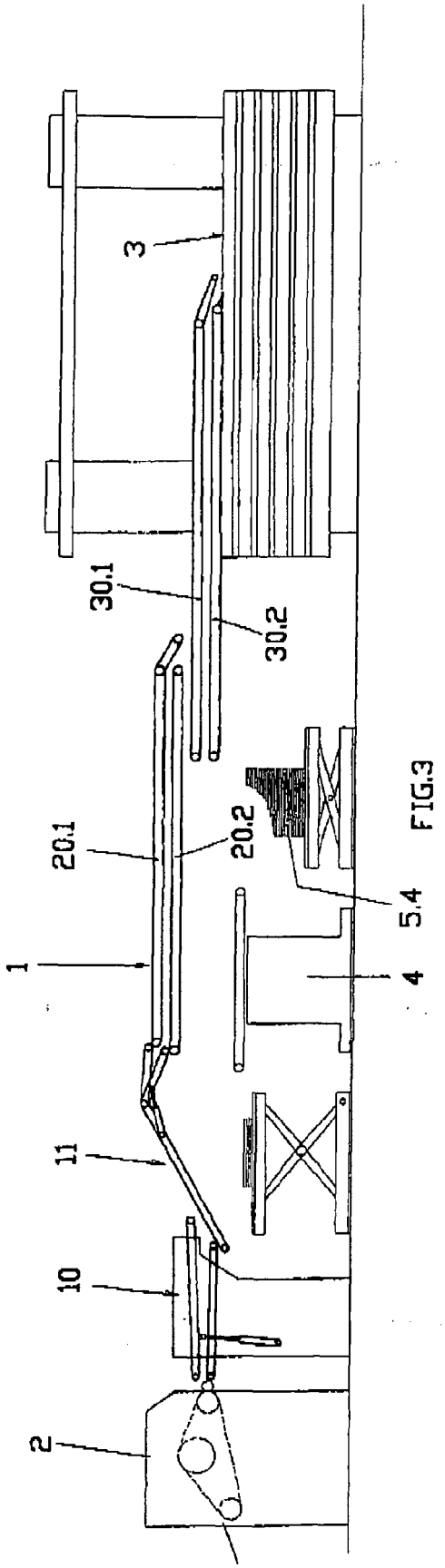
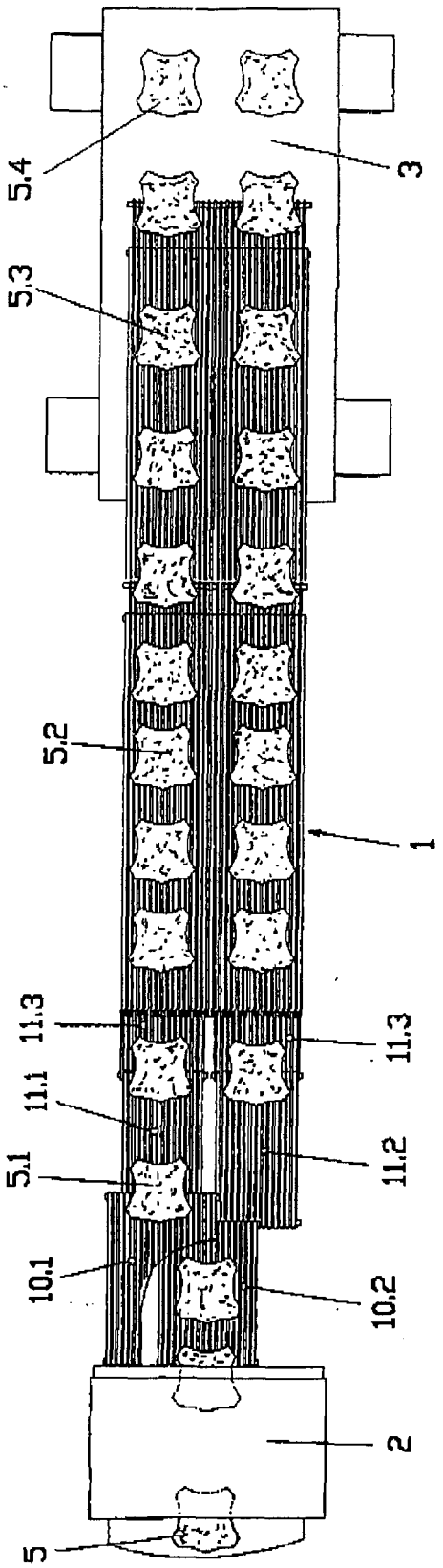

3
30.1
30.2
20.1
20.2
5.4
1
4
11
10
2

FIG.3


5.4
3
5.3
5.2
1
11.3
11.3
11.1
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10.2
2
5

FIG.4

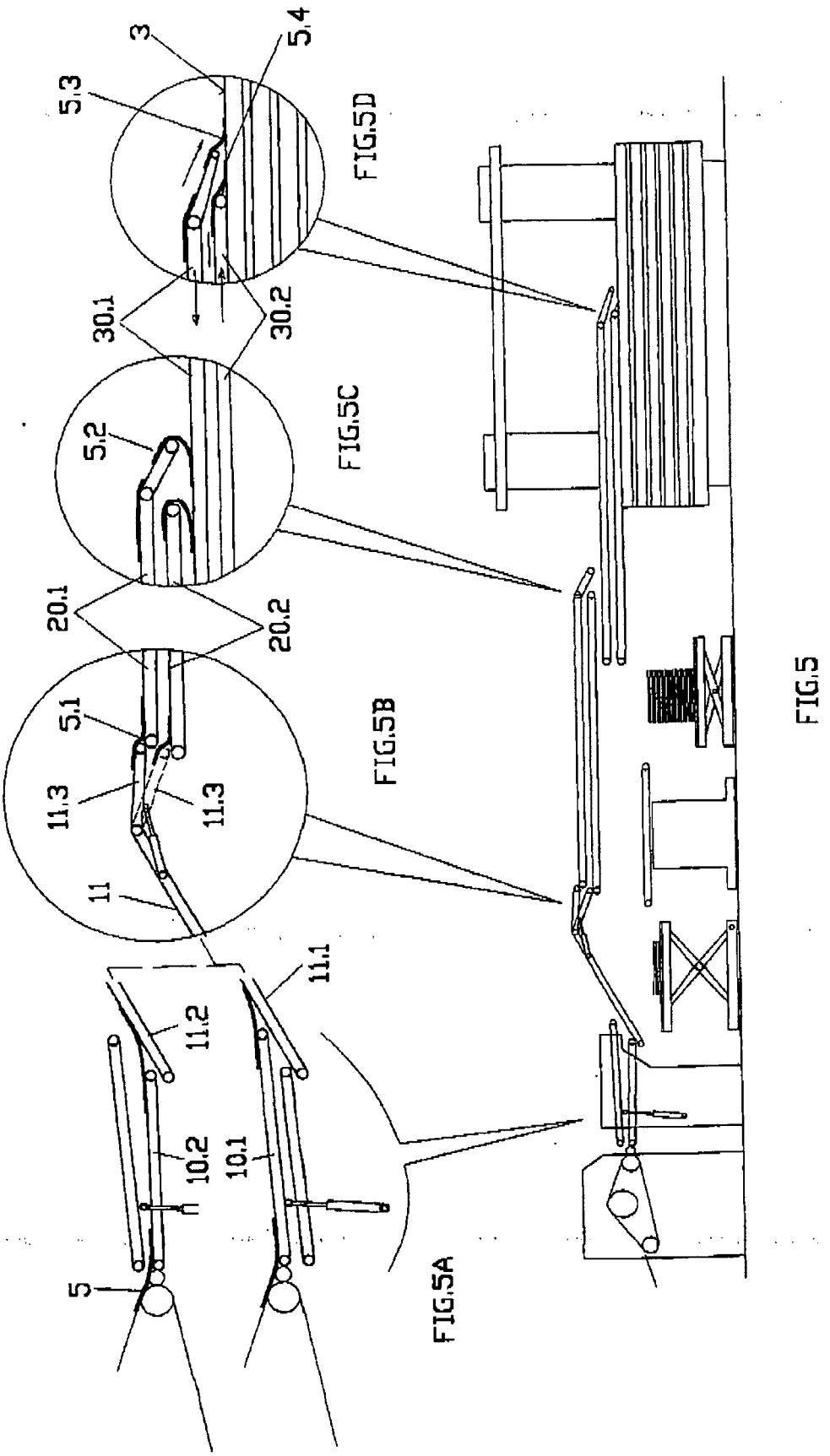
3
5.4
5.3
FIG.5D
30.1
30.2
5.2
FIG.5C
20.1
20.2
5.1
11.3
11.3
11
FIG.5B
11.1
11.2
10.2
10.1
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FIG.5A
FIG.5

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# EUROPEAN SEARCH REPORT

Application Number
EP 05 02 1768

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TECHNICAL FIELDS SEARCHED (IPC)

C14B

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 16 March 2006 | Helpiö, T. |

CATEGORY OF CITED DOCUMENTS

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16-03-2006

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