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(54) Process and apparatus for facing a manufactured article through powder coating

(57) The present invention relates to a facing process for at least one manufactured article (2) by means of powder coating comprising laying a first powder coating layer, fixing the first coating layer, laying a second powder coating layer having colour, tonality and/or organolectic properties different from the first coating layer, and final baking of the first and the second coating layers. After laying the second coating layer and before final baking, the process further comprises a relative displacement between the or each manufactured article (2) and a roller (34) having its lateral surface (36) in high- or bas-relief thereby producimg a desired decoration on the or each manufactured article (2), the roller 34 being held, in use, in contact with the or each manufactured article (2) to remove locally by rolling under control part of the second powder coating layer.

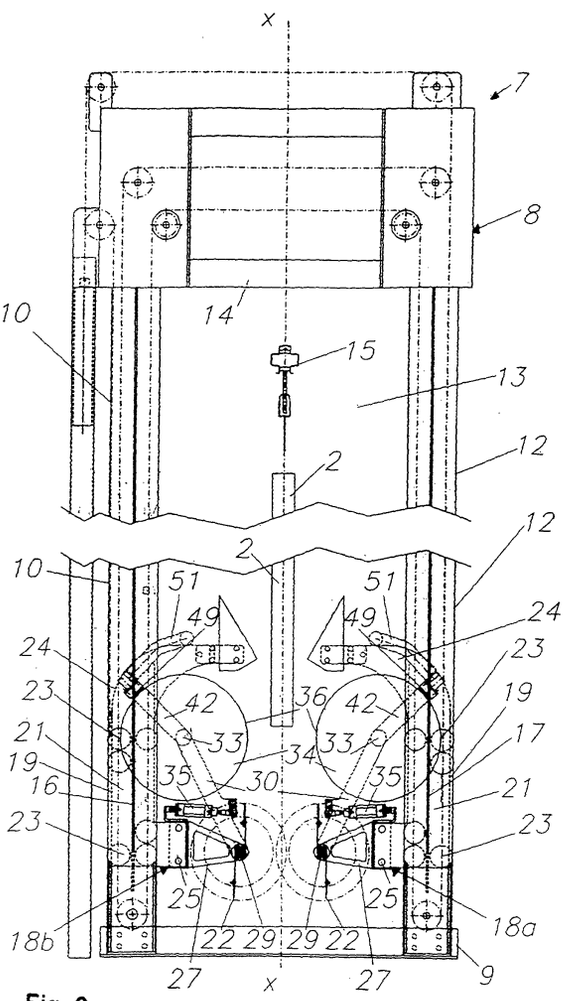

Fig. 2

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Description

[0001] The present invention relates to an enhancing or facing process for a manufactured article through powder coating and to an apparatus for carrying out the same. The term "manufactured article" is to be understood for all purposes of the present specification as comprising any metal article, e.g. section bars, metal sheets, to which coating powder can be applied according to any suitable industrial method.

[0002] Facing processes by means of powder coating are currently employed for decorating metal section bars as an imitation of a wood grain, to be used particularly for obtaining window or door casings and frames.

[0003] After being suitably prepared for powder coating, metal section bars undergo a working cycle comprising the following operative steps: initially a first powder coating layer or primer is laid out on the section bar; then partial polymerisation of the first coating layer takes place; successively a second powder coating layer different in colour or tonality from the underlying layer is applied according to a predetermined graphical configuration and finally baking is effected to completely polymerise both the first and the second coating layers.

[0004] The above-described coating process, although affected by some drawbacks that drastically limit its industrial applications, in so far as both mass production and total costs of the final manufactured article are concerned. The most critical step for such a working cycle turns out to be the application of the second coating layer, i.e. of the decorative layer, which task often committed to the experience and ability of qualified personnel capable of reproducing specific graphical configurations, e.g. a fake wood grain, on any metallic and non-metallic support, by working manually and making use of conventional tools, e.g. brushes and paintbrushes.

[0005] From the above, it be easily understood that it impossible to carry out an industrial process comprising a completely manual operation, in that the latter results in an unavoidable economically unbearable bottle-neck that heavily slows down the entire production cycle.

[0006] Attempts made to transform the facing process for manufactured articles from a substantially manual process to an automatized one, althogh, on the one hand, they made it possible to speed up the production cycle, on the other, they showed to fall short of giving satisfactory results as to quality in terms of wood resemblance, as they would require permanent manual intervention by specialized personnel downstream of the working cycle.

[0007] The main object of the present invention is to provide a facing or enhancing process for manufactured articles through powder coating to eliminate or substantially reduce the above mentioned drawbacks affecting conventional coating techniques.

[0008] An important object of the present invention is to make it possible that by means of the above-said process fake wood grain coating with a very high degree of wood resemblance is obtained in such short times as to be suitable for use in a completely automated working cycle and to do without any manual operation by specialized personnel.

[0009] Another object of the present invention is that by means of the above-said process it is possible to obtain a fake wood grain coating on manufactured articles at highly competitive costs owing both to an increase in productivity for the whole coating plant and a reduction of costs of specialized labour.

[0010] A still further object of the present invention is that the above-said process is applicable to both vertical and horizontal coating plants.

[0011] Not a last object of the present invention is to provide a vertical fake wood coating apparatus which makes it possible to obtain production levels equivalent to those of standard monocolor coating plants, while ensuring high quality aestethic results at the same time, in terms of. resemblance to a desired wood grain.

[0012] According to a first aspect of the present invention there is provided a process for facing or enhancing at least one manufactured article by means of powder coating comprising laying a first powder coating layer, fixing said first coating layer, laying a second powder coating layer having color, tonality or organolectic properties different from said first coating layer and final baking of said first and said second coating layers, said process being characterized in that it comprises, after laying said second coating layer and before final baking, causing relative displacement between the or each manufactured article and a roller having its lateral surface in bas-relief, thereby reproducing on the or each manufactured article a desired decoration, said roller being held, in use, in contact with the or each manufactured article to locally and controllably remove by rolling part of said second powder coating layer.

[0013] Advantageously, the said process provides for said roller being controlled to perform linear displacements in a longitudinal direction of the or each manufactured article and to rotate around its own axis with a speed of rotation corresponding to a rolling peripheral velocity substantially equal to its linear displacement velocity, thereby causing said roller to roll on the or each manufactured article.

[0014] Conveniently, the said process comprises controlling the said roller to perform linear displacements in the longitudinal direction of the or each manufactured article and to rotate around its own axis with a speed of rotation corresponding to a rolling peripheral velocity of said roller lower than its linear displacement velocity, in order to cause the said roller to roll and slide on the or each manufactured article.

[0015] According to another aspect of the present invention there is provided an apparatus for carrying out the said process, which apparatus including at least one conveying means arranged to support the or each manufactured article and sequentially to transfer the same throughout a number of working stations in a coating

plant, said apparatus being characterized in that it comprises a support frame located at a predetermined distance from the or each conveying means, at least one cursor element slidably mounted on said support frame, thereby being displaceable from one end of the or each manufactured article to the other, at least one roller supported by a respective cursor element and having a bas-relief lateral surface which has a desired original pattern suitable for being reproduced on the or each manufactured article, said roller being arranged to be shifted between a working position, at which it is in contact with the or each manufactured article to be enhanced or faced, and a rest position, at which it is withdrawn from the or each manufactured article, driving means arranged to cause said roller controllably to rotate around its own axis, and support and handling means for the or each roller, movably mounted on a respective cursor element and suita ble for shifting their respective roller between said rest position and said working position.

[0016] Advantageously, said support and handling means comprise at least one lever pivoted to a respective cursor element and suitable for performing controlled angular movements with respect thereto and at least one linear actuator having one end thereof articulated to its respective cursor element and its other end linked to its respective lever and being suitable for controlling said controlled angular movements of said lever to shift its respective roller between said working position and said rest position.

[0017] Further aspects and advantages of the present invention will better appear in the following detailed description of some currently preferred embodiments, given by way of non limiting examples with reference to the accompanying drawings, in which :

Figure 1 is a block-diagram showing the sequence of the working stations of a fake wood coating plant, according to the invention;
Figure 2 shows a front view of an apparatus according to the invention;
Figure 3 shows a side view on an enlarged scale of the mobile unit of the apparatus of Figure 2;
Figure 4 is a cross-section view of the mobile unit taken along line IV-IV of Figure 3;
Figure 5 shows a top view of a layer in resiliently deformable material with its surface in bas-relief used as a matrix in the rolling process;
Figure 6 is a cross-section view of the layer of Figure 5 taken along line VI-VI;
Figure 7 shows a top view of a second embodiment of the layer of Figure 5;
Figure 8 shows a cross-section view of the layer of Figure 7 taken along line VIII-VIII;
Figure 9 shows a perspective view of a portion of a manufactured article enhanced or faced through the plant of Figure 1;
Figure 10 shows a diagramatic view on a reduced scale of the mobile unit of Figure 3 with its roller and brushes while working;
Figure 11 shows a diagramatic view of the mobile unit of Figure 10 with roller and brushes at rest; and
Figure 12 is a diagramatic view of the mobile unit of Figure 10 with roller at rest and brushes in a working phase.

[0018] In the accompanying drawings similar or same parts or components have been identified with the same reference numerals.

[0019] With reference first to Figure 1, a plant 1 which is dedicated to imitation wood powder coating according to the invention, as shown by a block diagram and identified with reference number 1, can operate according to a working cycle comprising two or three stages depending upon whether two or three coating layers, respectively, are provided for the manufactured article to be decorated.

[0020] Plant 1, designed to carry out a two-stage working cycle, preferably comprises a first coating station 3 for applying a first powder coating layer, a fixing station 4 arranged downstream of the first coating station 3 and suitable for causing partial polymerisation of the first coating layer, a second powder coating station 5 for laying a second powder coating layer and a working station 6 for the final baking of both the first and the second coating layers.

[0021] Between the second coating station 5 and the final baking station 6, an apparatus 7 is provided, in which the process for enhancing manufactured articles 2 can takes place. Such a process comprises causing the manufactured article to undergo a rolling treatment, thereby obtaining, on the second coating layer not yet fixed and uniformly distributed on the manufactured article 2, a drawing or pattern as an imitation of wood grain.

[0022] As shown in Figures 2, 3 and 4, apparatus 7 preferably comprises a frame 8 comprising a base 9, a pair of side uprights 10 and 12 rising from base 9 and defining an intermediate vertically extending working area 13, and an upper crosspiece14 supported by the side uprights 10 and 12 and arranged to delimit zone 13 at the upper end thereof.

[0023] More particularly, as can be seen in Figure the working area 13 of apparatus 7 is crossed by an overhead conveyor 15 designed to support the manufactured article 2 in a vertical position and to convey it through the various working stations of plant 1. Advantageously, conveyor 15 is equidistant from the two side uprights 10 and 12 so that manufacture 2 is caused to follow, in use, a trajectory coinciding with the x-x center line of working area 13.

[0024] Moreover, side uprights 10 and 12 are provided with vertical guides 16 and 17 facing the working area 13, along which guides a respective mobile unit 18a and 18b is arranged to slide between a top and a bottom dead center, so as to be displaced, in use, close to the top end and the bottom end, respectively, of the manufactured article 2 in vertical trim.

[0025] As is better shown in Figure 3, mobile unit 18a and likewise mobile unit 18b preferably comprises a carriage 19 having a body 21 endowed with rollers or wheels 23 for rolling engagement with its respective vertical guide 17 and top 24 and bottom 25 end portions which are integral with body 21 and project therefrom towards working area 13.

[0026] To the bottom portion 25 of carriage 19 a fork 27 is secured, e.g. by means of bolts 26, which comprises a pair of side shoulders 28 arranged to support, at the free ends thereof, an oscillating pivot 29 acting as a linking element for a pair of levers 30 with respect to the carriage 19.

[0027] Each lever 30, having one longitudinal end 31 pivoted to the oscillating pivot 29 and its other longitudinal end 32 articulated to a shaft 33 whose rotation axis y-y supports a roller 34, is controlled, in use, so as to perform controlled angular movements around oscillating pivot 29, by a linear actuator 35, whereby shifting roller 34 between a working position, at which its lateral surface 36 is in contact with manufactured article 2 to be enhance or faced (see Figure 3), and a rest position , at which roller 34 is withdrawn from manufactured article 2 (as shown in Figure 2).

[0028] Linear actuator 35 can comprise, e.g. by a piston-and-cylinder unit mounted on the carriage 19, the cylinder 37 being pivoted to the bottom end portion 25, whereas the free end 38 of its piston 39 is articulated to its respective lever 30 at a linking pivot 40 located at a predetermined distance from oscillating pivot 29 of lever 30, thereby converting, in use, the back and fro movements of piston 39 with respect to cylinder 37 into closer to, and away from, movements, respectively, of roller 34 with respect to the manufactured article 2.

[0029] Advantageously, roller 34 is bound to rotate integral with shaft 33 that is caused to rotate, in use, by a motor 44 and controlled by an encoder (not shown in the drawings), both being arranged coaxially with axis y-y.

[0030] Moreover, to the longitudinal ends of shaft 33, on the side opposite to roller 34, two arms 42 are fixed and designed to support a horizontal pivot 45, which in turn bears a plurality of sucking means 49 suitable for removing the coating powder gathered on lateral surface 36 of roller 34 during the rolling treatment carried out on manufactured article 2.

[0031] As shown in Figure 3, and in particular in Figure 4, sucking means 49 comprise a series of suction orifices 50 in communication with a suction tube 51 and suitable for removing the coating powder retained during the rolling treatment, by lateral surface 36 of roller 34 and to convey it through sucking tube 51 towards a suitable storage and disposal reservoir (not shown in the Figures).

[0032] The use of suction means 49 is fundamental to ensure proper cleaning of lateral surface 36 of roller 34, since the same is advantageously in bas-relief according to a desired original that is to be reproduce on the surface 11 to be enhanced or faced of manufactured article 2.

[0033] As shown in Figures 5 to 8, on the lateral surface 36 of roller 34 a coating layer 52 of resiliently deformable material can be applied, having a working face 53 having a sequence of peaks 54 and recesses 56, suitably formed in it depending upon the graphical result meant to be obtained on the manufactured article 2.

[0034] As a matter of fact, when one wishes to reproduce a grain 55 which is an imitation of a specific type of wood on the surface 11 to be enhanced of manufactured article 2, on the working face 53 of coating layer 52 peaks 54 and recesses 56 are formed which extend randomly substantially in longitudinal direction of the coating layer 52 (see Figures 5 and 6). Once coating layer 52 has been laid, as described above, on roller 34, while the latter was rolling on the manufactured article 2 at a peripheral speed equal to the displacement speed of the moving carriage 19, working face 53 adheres only at its peaks 54 to the surface 11 to be decorated, on which a uniform powder coating layer has been previously laid. In this way, coating powder is locally removed, i.e. only at the peaks 54, thereby precisely reproducing onto it the drawing formed on working face 53.

[0035] Figures 7 and 8, instead, show a coating layer 52 with its working face 53 having a sequence of peaks 54 and recesses 56 shaped as concentric semicircles, by means of which it is possible to obtain, by causing roller 34 to roll and slide on the manufactured article 2, such a coating powder distribution on the surface to be decorated 11, as to reproduce a plurality of knots 57 as an imitation of a wood grain (as shown in Figure 9).

[0036] Advantageously, both mobile units 18a and 18b can comprise one or more brushes 22 fixedly mounted on their respective oscillating pivot 29 and integral in rotationg therewith, and a motor 66 suitable for moving brushes 22 to a desired position in order to cause them to work, in use, with a correct inclination of their bristles sliding against the surface 11 to be enhance of manufactured article 2.

[0037] The operation of the apparatus 7 is illustrated in Figures 10 and 11 showing the carriage 19 while being displaced forward, and meanwhile rolling and brushing operations of the surface 11 to be enhanced are carried out, and while being displaced backwards, respectively, with roller 34 and brushes 22 of the carriage 19 being at rest.

[0038] The forward stroke starts, preferably, when carriage 19 is at its top dead center. The roller 34 is then brought in contact with the surface 11 to be decorated by means of an angular movement of levers 30 controlled by piston-cylinder unit 35 about the oscillating pivot 29.

[0039] Should one wish to effect rolling by making roller 34 to roll onto the manufactured article 2, in combination with a downwards linear shift obtained by causing carriage 19 slide along its respective vertical guide 17,

motor 44 is controlled to cause, in use, roller 34 to rotate about its own axis y-y, so as to obtain a rolling peripheral speed at the contact line between roller 34 and manufactured article 2 equal to the vertical displacement speed of carriage 19.

[0040] Rolling with no sliding of the roller 34 on manufactured article 2 makes it possible for the working face 53 of coating layer 52 to adhere without sliding to the face 11 to be decorated and fot the coating powder previously uniformly deposited on the surface 11 to be decorated to be retained at the peaks 54, thereby leaving a mark exactly reproducing the original drawing provided on working face 53.

[0041] In order to obtain, instead, rolling with sliding of the roller 34 on the manufactured article 2, it is sufficient that motor 44 causes roller 34 to rotate about axis y-y, so that its peripheral rolling velocity is slower than the vertical displacement velocity of carriage 19. In this case, the mark obtained on the face 11to be decorated does not exactly reproduce the original provided on the working face 53 of coating layer 52, but a distorted image thereof suitable for reproducing knots 57 of a desired wood grain.

[0042] As shown in Figure 9, apparatus 7 is suitable for providing an imitation wood coating on a manufactured article 2, having both veins 55 and knots 57, typical of a milled wooden surface.

[0043] Such a result can be obtained by combining the rolling treatment by means of roller 34 with a brushing treatment by means of fixed brushes 22 provided with bristles sliding, in use, on the surface 11 to be decorated.

[0044] A two working stage plant 1 can effect brushing treatment and rolling tretment simultaneously by arranging, during the forward displacement of carriage 19, the brushes 22 in contact with the surface 11 to be decorated, while roller 34 is already in its working position. When carriage 19 reaches the bottom dead center, brushes 22 are caused to stop by a control unit (not shown in the Figures) at an angular position detected by an encoder (not shown in the drawings), at which position the bristles ob brushes 22 are no longer in contact with manufactured article 2, and are held in that position during the entire return displacement of carriage 19.

[0045] To obtain grains 55 on the surface 11 to be decorated, apparatus 7 can include comb members (not shown in the Figures), instead of brushes 22, which comb members are mounted on a respective carriage 19 to effect with it an alternate straight movement. Each comb member comprises a plurality of tines of flexible material, which are spaced at a uniform or irregular pitch, have their free ends sharpened or flattened and are suitable for sliding, in use, on a manufactured article 2.

[0046] The powder coating proces, the plant and the apparatus for carrying out the same as described above are susceptible to numerous modifications and variations within the scope of the claims.

[0047] Thus, for example, as shown in Figure 1, plant 1 can operate according to a three coating stage working cycle that can be carried out by providing, between the above described apparatus 7 and the final baking station 6, a fixing station 60 suitable for causing partial polymerisation of the second coating layer just treated, a third coating centre 61 arranged to apply a third powder coating layer having colour, tonality and/or organolectic properties different from those of the underlying second layer, and a second apparatus 7 designed obtain a wood imiotation in the third just laid coating.

[0048] With such a plant 1 it is then possible to obtain wood grains 55 and knots 57 in two separate phases and on two different coating layers, with the advantage of distinguishing one from the other by providing powder coatings of different colour or tonality.

[0049] Preferably, wooden grains 55 are obtained in the first apparatus 7 through a brushing or a rolling treatment with no bristles sliding on the second coating layer just laid on the manufactured article 2.

[0050] In order to carry out the brushing treatment, apparatus 7 is set as shown in Figure 12, in which roller 34 is moved away from the surface 11 to be decorated and brushes 22 are brought into their working position and caused to shift in a vertical direction by the carriage 19 along a respective guide 17, thereby sliding on the surface 11 to be decorated in order to remove part of the second coating layer to obtain a plurality of grains 55 on it.

[0051] In the second case, indeed, grains 55 are obtained by roller 34 rolling on the manufactured article 2, on which roller a coating layer 52, as shown in Figure 5, is laid.

[0052] Once fixing of the second coating layer thus treated has been effected and the third powder coating layer has been laid, the rolling and sliding treatment takes place at the second apparatus 7 and a coating layer 52, as shown in Figure 7, is lapplied to roller 34 for that purpose.

[0053] In practice, materials as well as dimensions can be various according to requirements.

Claims

1. A process for facing or enhancing at least one manufactured article by means of powder coating comprising laying a first powder coating layer, fixing said first coating layer, laying a second powder coating layer having color, tonality or organolectic properties different from those of said first coating layer and final baking of said first and said second coating layers, said process being **characterized in that** it comprises, after laying said second coating layer and before final baking, causing relative displacement between the or each manufactured article and a roller having its lateral surface in bas-relief, thereby reproducing on the or each manufactured article

a desired decoration, said roller being held, in use, in contact with the or each manufactured article to locally and controllably remove by rolling part of said second powder coating layer.

2. A process as claimed in claim 1, **characterized in that** it comprises controlling said roller to perform linear displacements along the longitudinal direction of the or each manufactured article and to rotate abaut its own axis with a speed of rotation corresponding to a rolling peripheral velocity substantially equal to its linear displacement velocity, so that said roller rolls but does not slide on the or each manufactured article.

3. A process as claimed in claim 1, **characterized in that** it comprises controlling said roller to perform linear displacements along the longitudinal direction of the or each manufactured article and to rotate about its own axis with a speed of rotation corresponding to a rolling peripheral velocity substantially lower than its linear displacement velocity, so that said roller rolls and slides on the or each manufactured article.

4. A process as claimed in any preceding claim, **characterized in that** it comprises applying said lateral high- or bas-relief surface on said roller, which surface comprises a layer of resiliently deformable material having a plurality of bas-reliefs delimiting a sequence of peaks and recesses, whereby engaging, in use, with said second coating layer and locally and controllably removing it the or each manufactured article at the said peaks.

5. A process as claimed in any preceding claim, **characterized in that**, after said second coating layer has been laid and before said rolling treatment, it comprises:

- a brushing treatment for said second coating layer by means of at least one brush with bristles sliding on said manufactured article;
- fixing of said second coating layer;
- laying of a third powder coating layer having color, tonality and/or organolectic properties different from those of said second coating layer, and
- rolling treatment for the said third paint layer.

6. A process as claimed in any preceding claim 1 to 4, **characterized in that**, after said second paint layer has been laid, it comprises:

- a first rolling treatment by means of a roller having lateral high- or bas-relief surface including a multiplicity of substantially parallel engravings or grooves, thereby producing an imitation of wood grain on said manufactured article;
- fixing of said second coating layer;
- laying of a third powder coating layer,
- a second rolling and sliding treatment by means of a roller having lateral surface provided with a plurality of concentric high- or bas-relief semicircles suitable for producing a multiplicity of knots as an imitation of a wood grain on the or each manufactured article.

7. A plant for carrying out the process as claimed in any preceding claim, **characterized in that** it comprises a first powder coating centre to lay a first powder coating layer, a fixing centre for said first coating layer downstream of said first coating centre, a second poweder coating centre designed to apply a second powder coating layer and a working station designed to provide final baking of said first and said second coating layers, and an apparatus arranged between said second painting centre and said final baking station and suitable for providing a rolling and/or brushing treatment on the surfaces of the or each manufactured article, thereby producing a desired decoration thereon.

8. A plant according to claim 7, **characterized in that**, between said apparatus and said final baking station, it comprises, in sequence, a second fixing centre suitable for providing partial polymerisation of said second coating layer just treated by said apparatus, a third coating centre suitable for applying a third powder coating layer having color, tonality and/or organolectic properties different from those of said second coating layer and a second apparatus designed to carry out a rolling and/or brushing treatment on said third coating layer.

9. An apparatus designed for the plant as claimed in claim 7 or 8, comprising at least one conveying means designed to support the or each manufactured article and to sequentially transfer it throughout the various working stations of a power coating plant, said apparatus being **characterized in that** it comprises a support frame located at a predetermined distance from the or each conveying means, at least one cursor element slidably mounted on said support frame, thereby being shifted, under control, between one end and the other of the or each manufactured article, at least one roller borne by a respective cursor element and having a lateral high- or bas-relief surface that reproduces a desired pattern and is suitable for reproducing it on the or each manufactured article, said roller being arranged to be displaced between a working position, where it is in contact with the or each manufactured article to be enhanced, and a rest position, where it is withdrawn from the or each manufactured article, driving means arranged to cause said roller to be

controllably rotated about its own axis, and support and handling means for the or each roller movably mounted on a respective cursor element and designed to displace the respective roller between said rest position and said working position.

10. An apparatus as claimed in claim 9, **characterized in that** said lateral high- or bas-relief surface comprises a layer of resiliently deformable material having a sequence of peaks and recesses delimiting a desired pattern to be reproduced on the or each manufactured article by said peaks controllably and locally removing a powder coating layer laid and not fixed on a surface to be decorated.

11. An apparatus as claimed in claim 10, **characterized in that** said layer of resiliently deformable material has a plurality of bas-reliefs extending in circumferential direction, in such a way as to produce on the or each manufactured article an imitation of a wood grain.

12. An apparatus as claimed in claim 10, **characterized in that** said layer of resiliently deformable material has a plurality of concentric bas-reliefs semicircles suitable for producing on the or each manufactured article a multiplicity of knots as an imitation of a wood grain through a rolling and sliding treatment.

13. An apparatus as claimed in any claim 9 to 12, **characterized in that** said support and handling means comprises at least one lever pivoted on a respective cursor element and desinged to perform controlled angular movements with reference thereto and at least one linear actuator having one end thereof articulated to its respective cursor element and its other end articulated to its respective lever and arranged to control said controlled angular movements of said lever thereby displacing its respective roller between said working position and said rest position.

14. An apparatus as claimed in claim 13, **characterized in that** said linear actuator comprises a piston-cylinder unit.

15. An apparatus as claimed in any claim 9 to 14, **characterized in that** said frame comprises guide means for the or each cursor element having rolling means engaging with its respective guide means.

16. An apparatus as claimed in claim 15, **characterized in that** the or each cursor element comprises a carriage.

17. An apparatus as claimed in any claim 9 to 16, **characterized in that** it comprises at least one brush carried by the or each cursor element and checking and control means for the or each brush designed to alternate a working phase, where the or each brush slides with its bristles on the or each manufactured article, and a rest phase, where the or each brush is in a position such as to porevent interference with the or each manufactured article to be enhanced.

18. An apparatus as claimed in claim 17, **characterized in that** the or each brush is mounted on a respective cursor element and is caused to move to a working position by rotating about a pivot having a substantially horizontal axis and, while in its rest phase, to move away to a predetermined angular position, in which its bristles do not engage with the or each manufactured article.

19. An apparatus as claimed in claim 17 or 18, **characterized in that** the or each brush is interchangeable and that it comprises support means for the or each brush on its respective cursor element.

20. An apparatus as claimed in any claim 17 to 19, **characterized in that** said checking and control means comprises a motor arranged to cause its respective brush to rotate about its respective pivot, and an encoder electrically connected to said motor and designed to control the angular position of the or each brush both during working and rest phase.

21. An apparatus as claimed in any claim 9 to 20, **characterized in that** it comprises sucking means fixed to the or each cursor element and arranged to to be located, together with its respective roller in its working position, close to its lateral surface, therfeby taking away any coating powder removed from the surface to be enhanced of the or each manufactured article by means of said roller and gathered at said lateral bas-relief surface.

22. A product when enhanced or faced by means of the process according to any claim 1 to 6 **characterized in that** it comprises decorated wood imitation surfaces in two or more colours with a plurality of grains extending in a substantially longitudinal direction and/or knots as an imitation of a wood grain.

Fig. 1

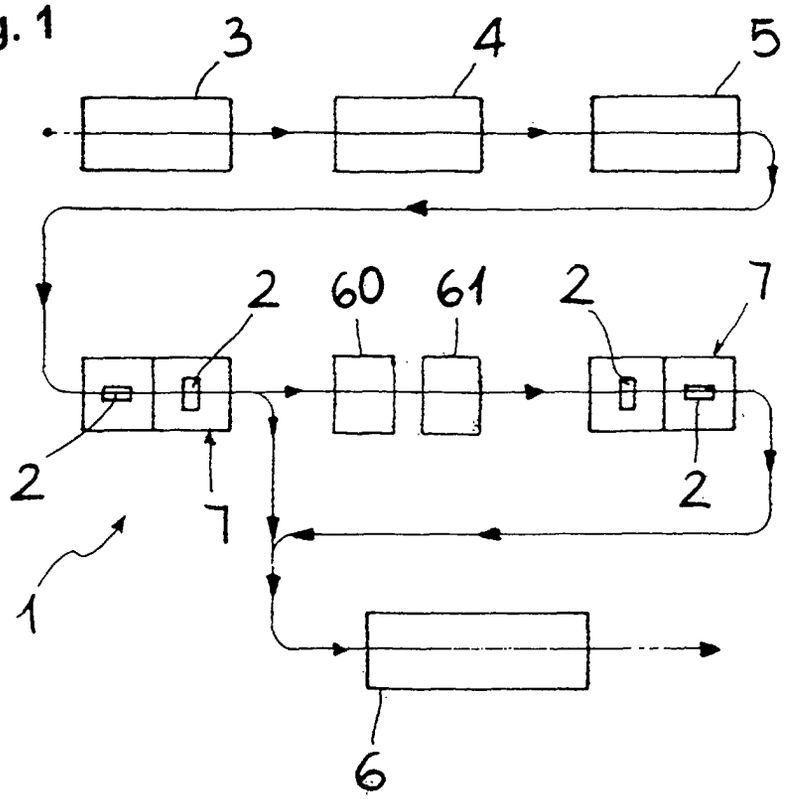
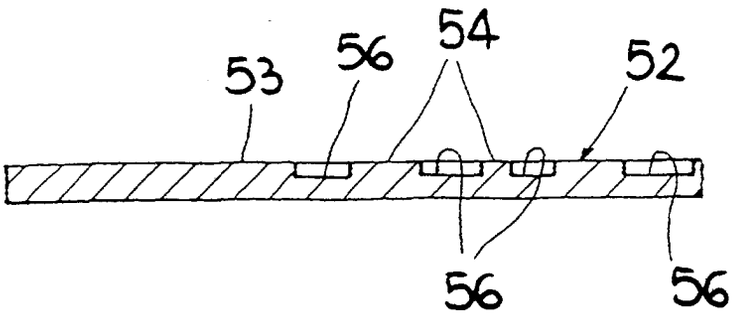


Fig. 6



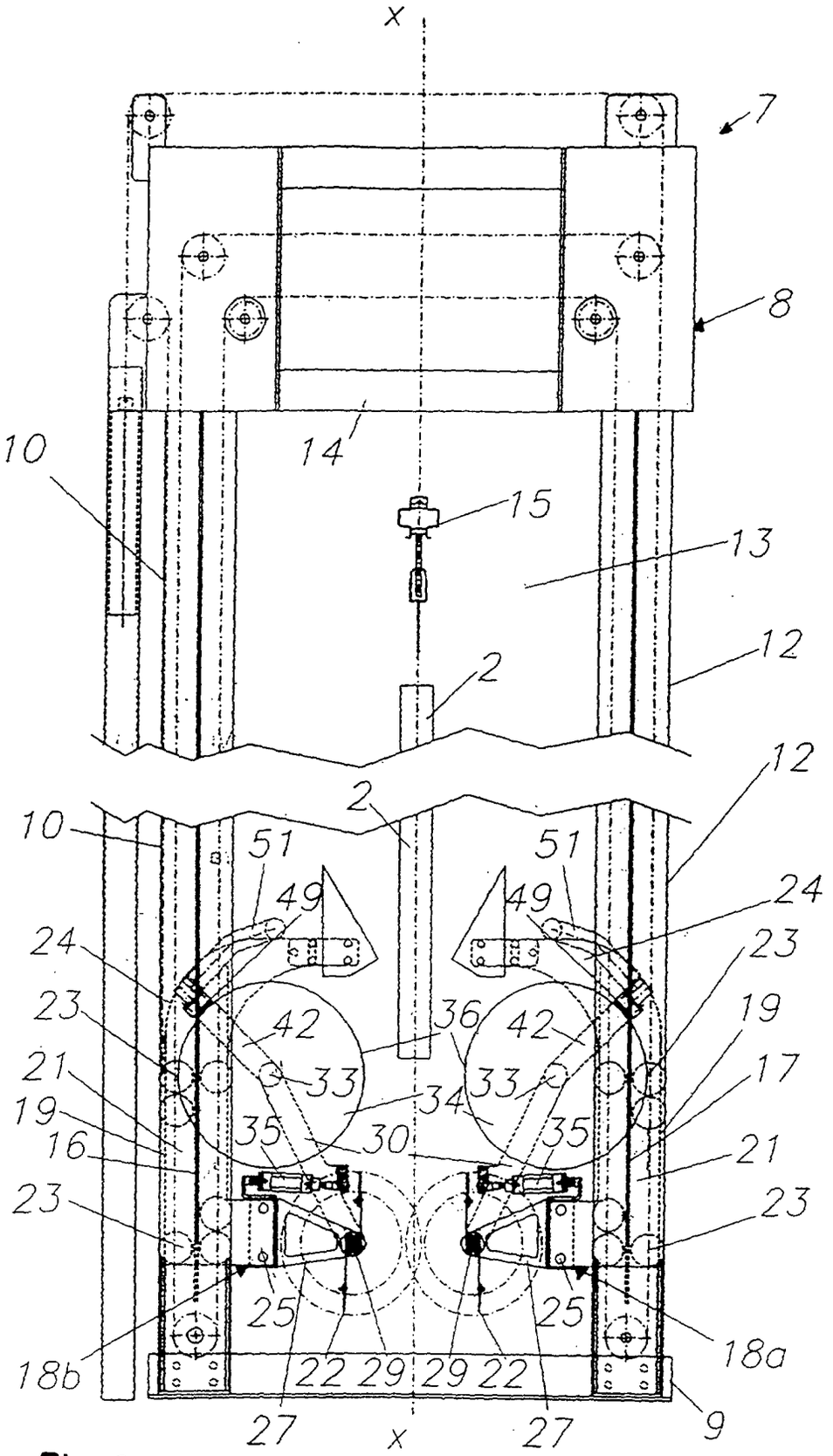

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Fig. 2

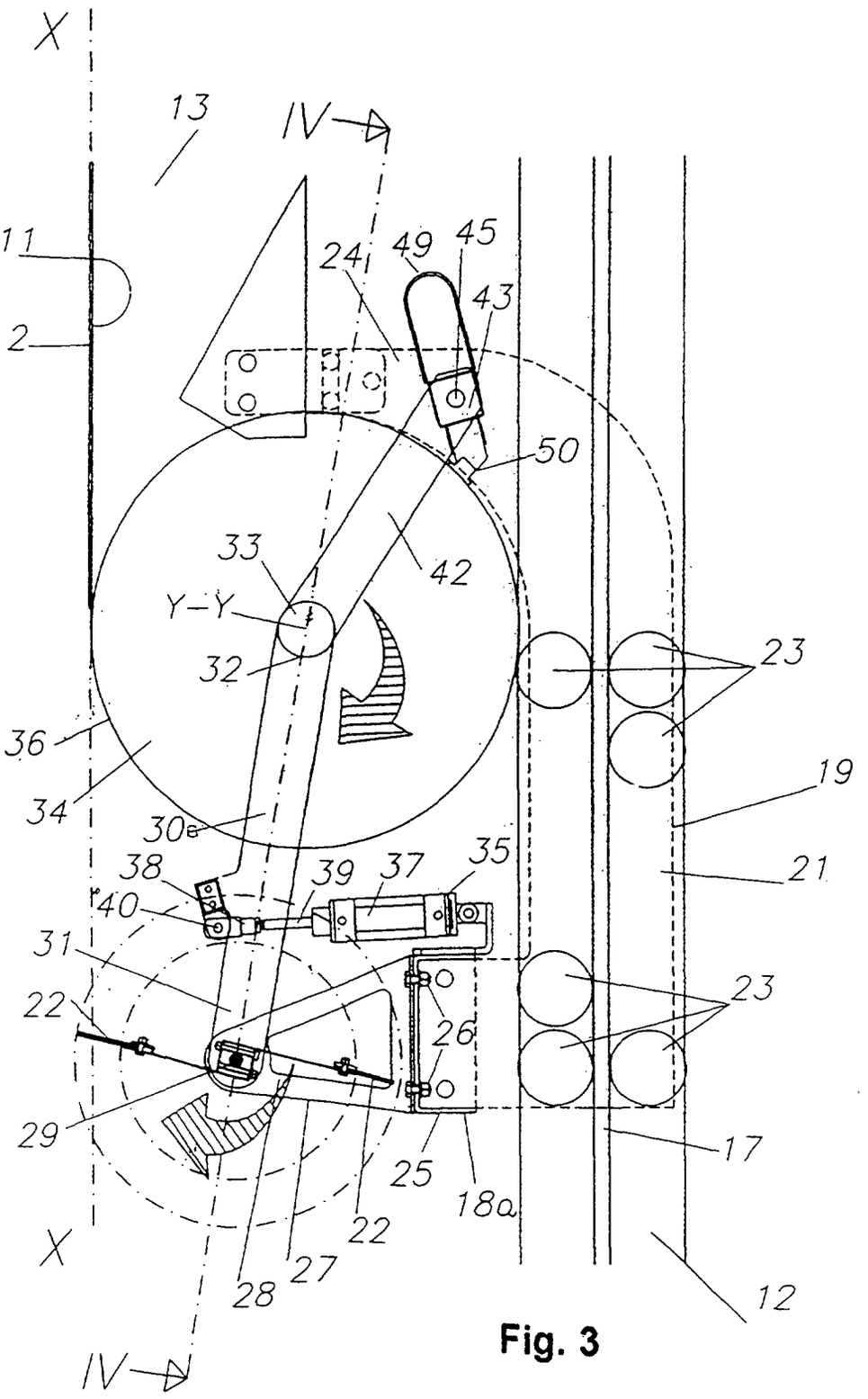
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Fig. 3

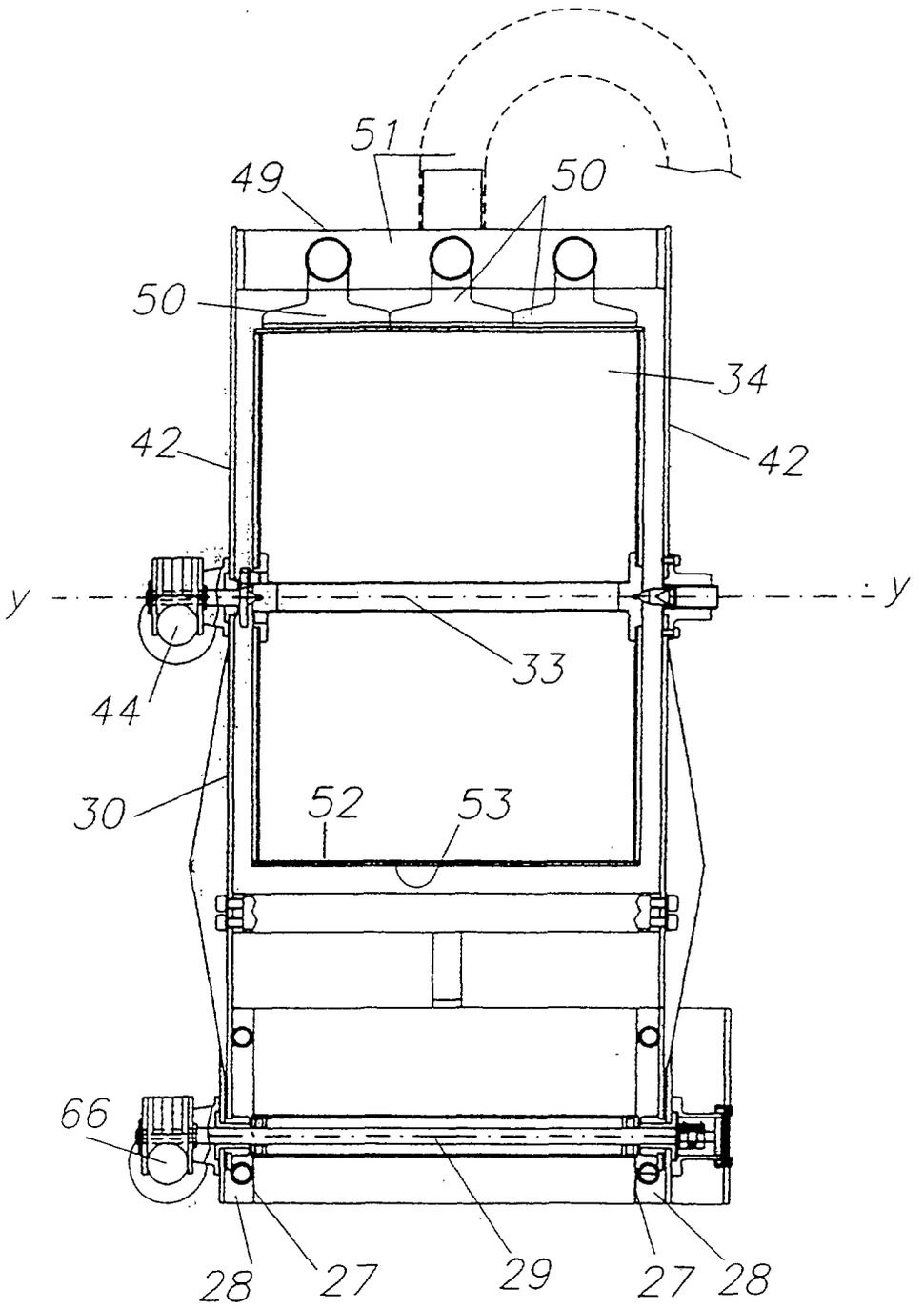


Fig. 4

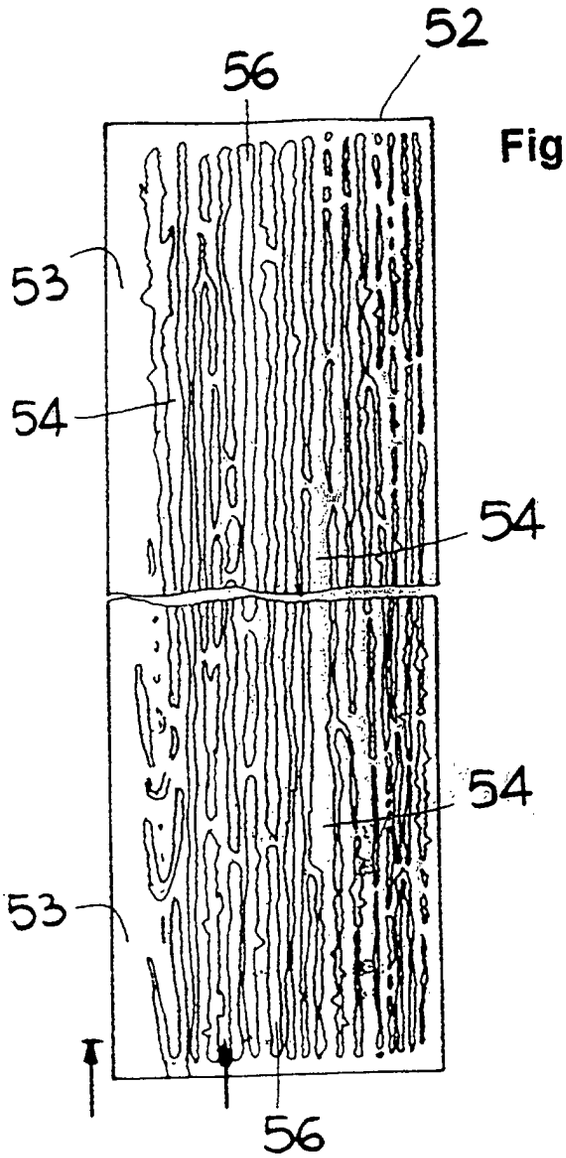


Fig. 5

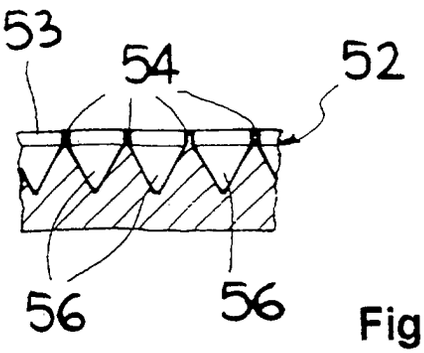
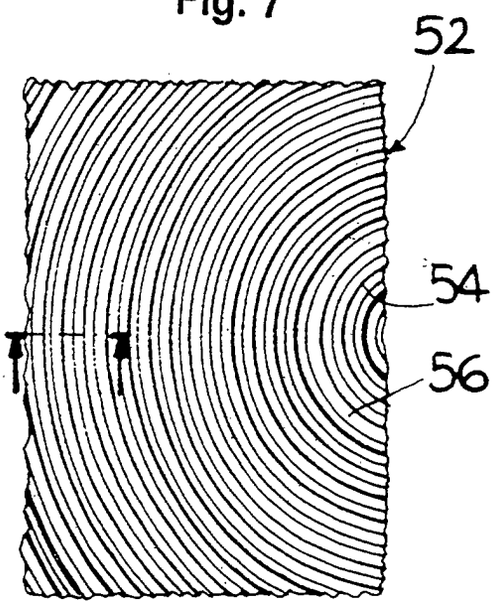


Fig. 8

Fig. 7



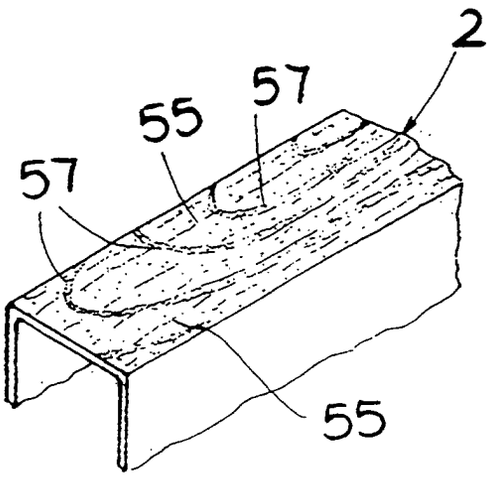


Fig. 9

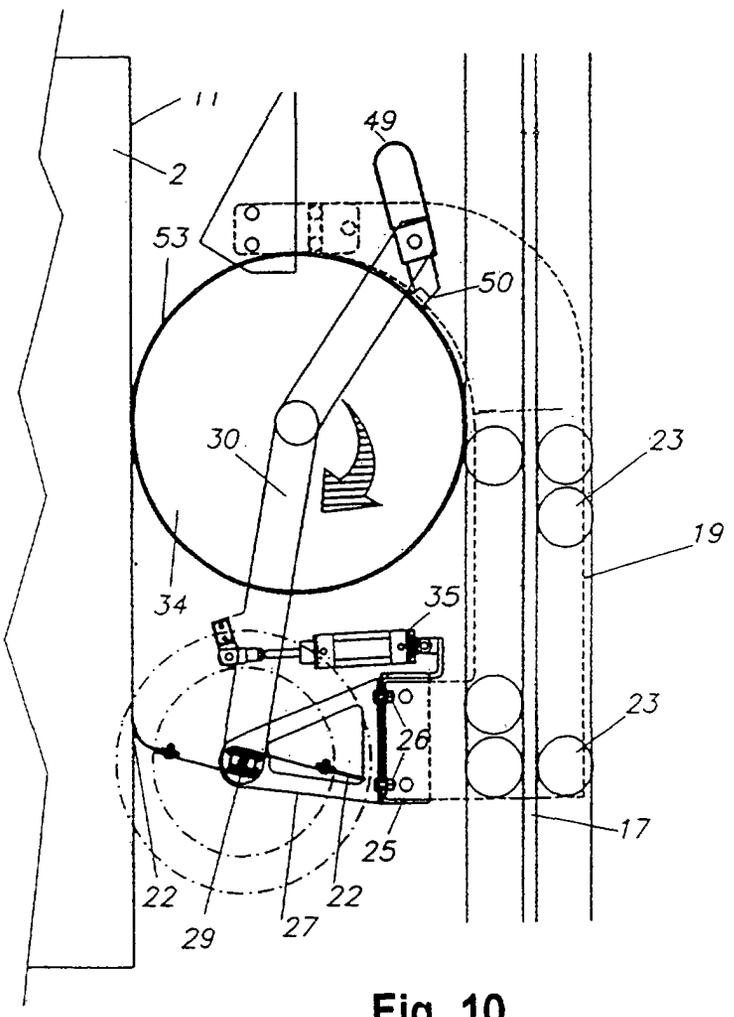


Fig. 10

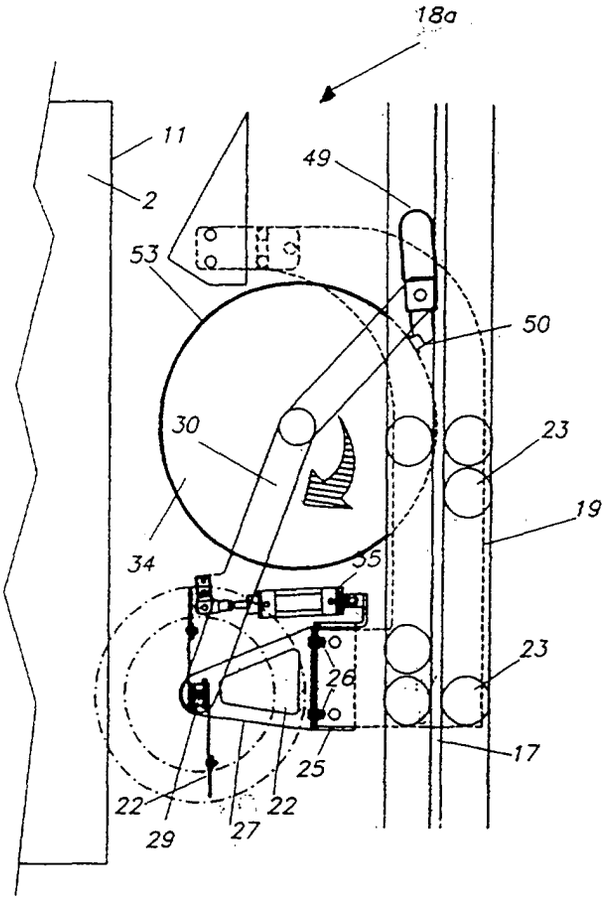

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Fig. 11

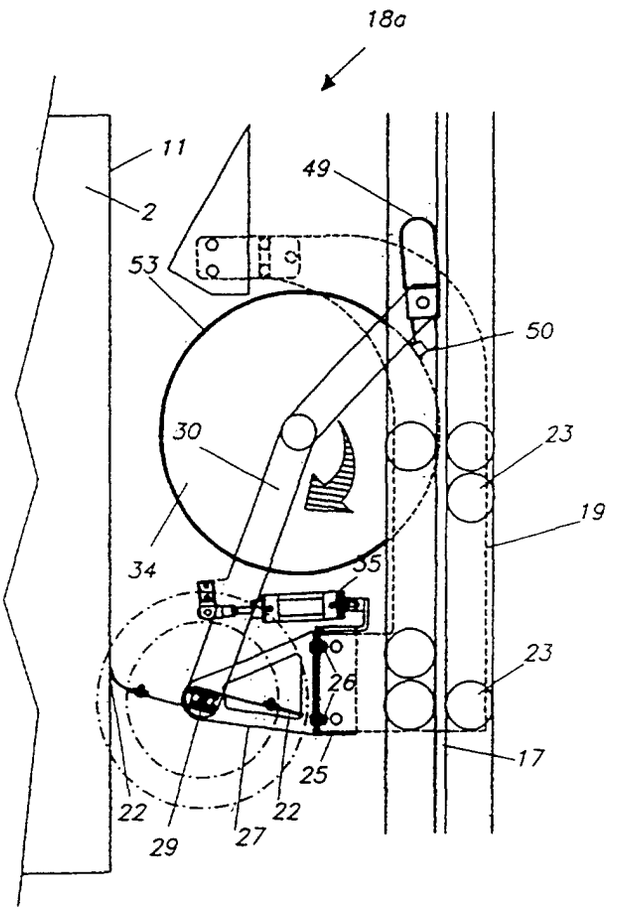
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Fig. 12