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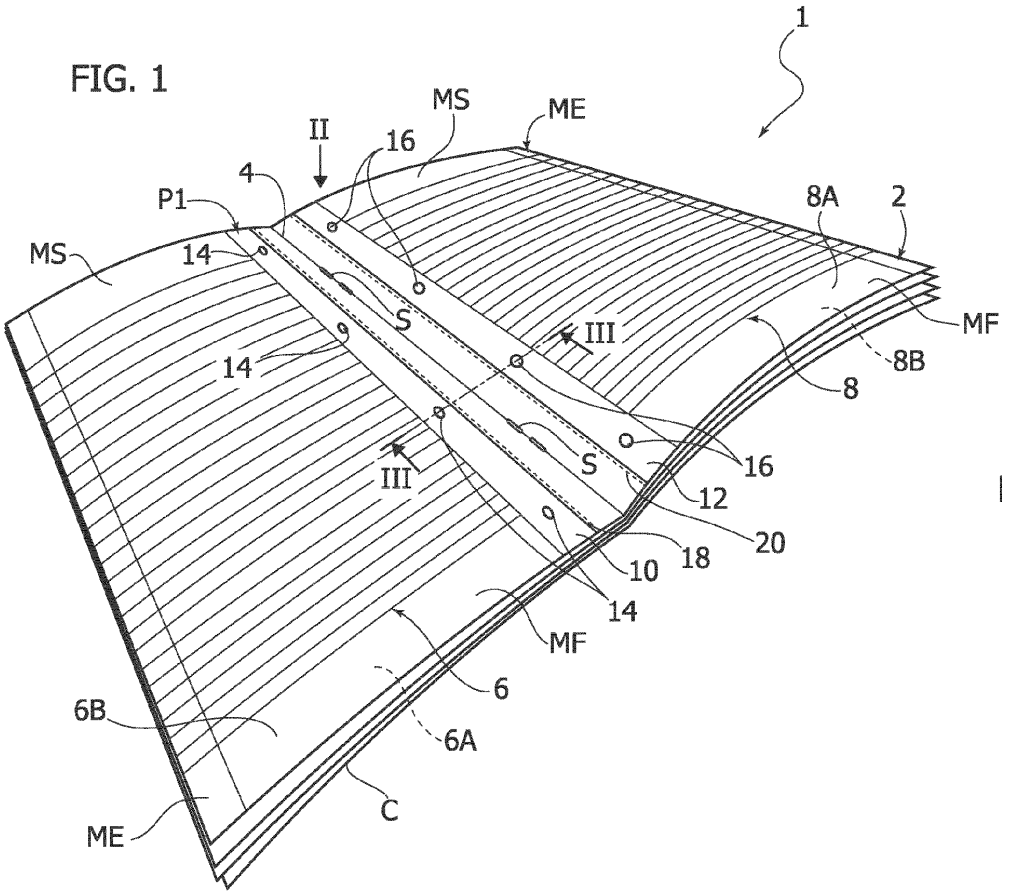
(54) **A STATIONERY ARTICLE AND RELATED MANUFACTURING METHOD**

(57) There is described a stationery article (1) comprising a plurality of sheets arranged in a stack and coupled along a folding line (4). The sheets are folded along the folding line, so as to define a notebook. Each sheet comprises a first sheet portion (6) and a second sheet portion, which are separable along tear-off lines (18, 20).

FIG. 1

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## Description

### Field of the Invention

**[0001]** The present invention relates to stationery articles such as for example notebooks.

### Prior Art

**[0002]** The well-known flexibility of so-called ring binders for organizing the documents contained therein has led to a widespread use of various stationery articles provided with perforations and adapted to be used in combination with such ring binders. At the same time, various solutions have been proposed to reinforce the perforations (reinforcing tapes or so-called "hole reinforcements") to prevent the perforations from lacerating when they are used with the ring binder.

**[0003]** A first example of such stationery products includes the reams of loose perforated sheets, which however do not have a binding and therefore must be used in combination with a ring binder. The loose perforated sheets are sold both with the provision of a reinforcing tape and without reinforcing tape.

**[0004]** A second example of such products includes the so-called spiral notebooks or blocks, wherein the package of perforated sheets is bound by a spiral of rings, and wherein each sheet has a tear-off line arranged between the binding perforation and the perforation to be used with a ring binder, so as to make it possible to separate single sheets from the binding as needed. Also in this case the sheets are provided with reinforcing tapes at the perforations to be used with a ring binder.

**[0005]** Among the common problems encountered with so-called spiral notebooks or blocks it is possible to mention a higher manufacturing cost and a bigger size, because spirals must be very wide to enable an easy detachment of the pages. This makes it difficult to insert said spiral notebook e.g. into a bag or a briefcase, given the risk of crushing the metal spiral and therefore causing a malfunction of the product. Moreover, such a product involves the presence of a big amount of metal material in a paper product, which poses difficulties for separation and recycling when the product must be disposed of. In addition, the presence of a very dense perforation in a limited space for the spiral binding seriously weakens the sheets in the binding area, which often causes a laceration of the binding perforation when a separation is attempted along the tear-off line, because the die-cutting of the tear-off line is often more resistant to laceration than the binding perforation itself.

### Object of the Invention

**[0006]** The invention aims at solving the problems described in the foregoing. Specifically, the invention aims at providing a stationery article which collects separable sheets adapted to be used with a ring binder, but which does not exhibit the drawbacks of the articles having a spiral binding. A further object of the invention is providing a stationery article with reinforcing formations the manufacture of which is particularly simple, rapid and economical.

**[0007]** According to a second aspect, a further object of the invention is providing sheets for stationery articles which have reinforcing formations and the manufacture whereof is particularly simple, rapid and economical, and which further require the use of a lesser amount of reinforcing material.

### Summary of the Invention

**[0008]** The object of the invention is achieved by a stationery article, by a manufacturing method of sheets for stationery articles and by a sheet for stationery articles having the features according to the claims which follow, and which are an integral part of the technical disclosure provided herein in relation to the invention.

### Brief Description of the Figures

**[0009]** The invention will now be described with reference to the annexed Figures, which are provided by way of non-limiting example only, and wherein:

- Figure 1 is a perspective view of a stationery article according to an embodiment of the invention,
- Figure 2 is an enlarged detail view along arrow II of Figure 1,
- Figure 3 is an enlarged partial sectional view, the dimensions whereof have been altered for illustration purposes, along line III-III of Figure 1,
- Figure 4 is a schematic diagram showing an aspect of the invention,
- Figure 5 is a schematic diagram showing an apparatus implementing the manufacturing method according to an embodiment of the invention,
- Figure 6 is a schematic diagram showing a further aspect of the invention according to Figure 5,
- Figure 7 comprises portions I, II, III, IV, V, showing method steps implemented at sections I, II, III, IV, V of Figure 5,
- Figure 8 is a schematic diagram of an apparatus implementing the manufacturing method according to a further embodiment of the invention,
- Figure 9 is a schematic diagram showing another aspect of the invention according to Figure 8,
- Figure 10 comprises portions I, II, III, IV, V showing method steps implemented at sections I, II, III, IV, V of Figure 8,
- Figure 11 is similar to Figure 3, but refers to the embodiment of Figures 8-10,
- Figure 12 and Figure 13 schematically show two further embodiments of the stationery article according to the invention,
- Figure 14 is a schematic diagram of an apparatus

implementing a manufacturing method according to yet another embodiment of the invention,

- Figure 15 is a schematic diagram showing yet another aspect of the invention according to Figure 14,
- Figure 16 is a schematic diagram of an apparatus implementing a manufacturing method according to yet another embodiment of the invention
- Figure 17 is a schematic diagram showing a further aspect of the invention according to Figure 16,
- Figure 18 comprises portions I, II, III, IV, V showing method steps implemented at sections I, II, III, IV, V of Figure 16, and
- Figure 19 comprises portions I, II, III, IV, V showing method steps implemented at sections I, II, III, IV, V of Figure 14.
- Figure 20 corresponds to Figures 7, 10, 18, 19, but relates to further embodiments.

Detailed Description

**[0010]** Reference number 1 in Figure 1 generally denotes a stationery article according to an embodiment of the invention.

**[0011]** The stationery article 1 is preferably configured as a "big" notebook with A4 pages, obtained by symmetrically folding a stack of A3 sheets, or configured as a bigger or smaller notebook (e.g. with A5 pages, obtained through symmetrical folding of a stack of A4 sheets).

**[0012]** Article 1 therefore comprises a plurality of (paper) sheets 2 arranged in a stack, and coupled to one another at a folding line 4. The coupling is preferably obtained by means of metal staples S, the prongs whereof go through the whole stack of sheets 2 and through an optional cover C arranged at the basis of the stack, exit from the opposite side of cover C at the folding line 4, and then are folded one towards the other at the folding line itself.

**[0013]** According to the invention, each sheet 2 comprises a first sheet portion 6 and a second sheet portion 8, arranged on opposite sides of the folding line 4. Referring to Figure 3, the first sheet portion 6 comprises a first face 6A and a second face 6B, opposite to each other, and the second sheet portion 8 comprises a third face 8A and a fourth face 8B, equally opposite to each other. The faces 6B, 8A are located on a first side (or face) of sheet 2, while the faces 6A, 8B are located on a second side (or face) of sheet 2, which is opposite to the former.

**[0014]** Each sheet 2 moreover comprises a first formation of tape material, which is applied onto the first sheet portion 6, and a second formation of tape material which is applied onto the sheet portion 8 on an opposite side of the folding line 4 with reference to the first formation of tape material.

**[0015]** In the embodiments of the invention as per Figures 1 to 11, the first formation of tape material comprises a first tape 10 applied onto the first sheet portion 6 and extending continuously along sheet 2, while the second formation of tape material comprises a second tape 12, which equally extends continuously along sheet 2 and which is applied onto the second sheet portion 8 on an opposite side of the folding line 4 with reference to tape 10.

**[0016]** In some of the above-mentioned embodiments, the tapes 10, 12 are applied on the same face of sheet 2. In other words, the tapes 10, 12 are applied either on the second and third faces 6B, 8A (Figure 3), or on the first and fourth faces 6A, 8B (not shown, but obvious).

**[0017]** In other above-mentioned embodiments, the tapes 10, 12 are applied on opposite faces of sheet 2. In other words, tapes 10, 12 are applied on the first and third faces 6A, 8A (Figure 11) or on the second and fourth faces 6B, 8B (not shown, but obvious).

**[0018]** Whatever the pair of faces whereon the tapes 10, 12 are applied, in the embodiments the first tape 10 and the second tape 12 are applied parallel to each other and parallel to the folding line 4.

**[0019]** A first perforation P1 is provided in the first sheet portion 6, and a second perforation P2 is provided in the second sheet portion 8. Each of said first perforation P1 and second perforation P2 comprises a plurality of holes 14, 16 (so called "filing holes") which respectively go through the sheet 2 and through the respective first or second tape 10, 12, as shown in Figure 3 (and more generally go through the sheet 2 and the corresponding first or second formation of tape material). The holes 14, 16 of each perforation P1, P2 are aligned along a direction parallel to the folding line 4, and are arranged according to the most common layouts of rings available on the market. The Figures show a pattern of four holes 14, 16 is shown, but perforations are possible having two single holes or a mixed (universal) pattern, for adapting to every ring binder.

**[0020]** A first and a second tear-off lines 18, 20 are provided, respectively, on the first sheet portion 6 and on the second sheet portion 8. The first tear-off line 18 is arranged between the first tape 10 and the folding line 4, and the second tear-off line 20 is arranged between the second tape 12 and the folding line 4. Each one of said first tear-off line 18 and second tear-off line 20 is respectively configured for the separation of the first sheet portion 6 and of the second sheet portion 8 from the sheet 2 (from the remaining part of sheet 2). Preferably, the tear-off lines 18, 20 are arranged immediately adjoining tapes 10, 12, as shown in Figure 3. The tear-off lines 18, 20 comprise a (through) dotted die-cutting, configured to enable the tear-off separation of each sheet portion 6, 8 along the tear-off line itself.

**[0021]** As can be seen in Figure 1, each sheet portion may be provided with the usual graphical aids for writing and/or drawing. In the embodiment shown herein, each sheet portion 6, 8 bears - on each face 6A, 6B, 8A, 8B - a typographic pattern of lines, comprising an inner margin MI, an outer margin ME, an upper margin MS and a lower margin MF. Said margins define an area wherein the pattern of lines is provided, which preferably extends also

into the outer margin ME. Margins MS, MF and MI are preferably devoid of a typographic pattern of lines, although obviously any distribution of the pattern is possible according to needs. For each sheet portion, the assembly consisting of the tapes 10, 12 (with the associated perforation P1, P2) and the tear-off line 18, 20 is arranged within the inner margin M1.

**[0022]** With reference to Figure 4 (which for clarity only partially illustrates the cover), in the stationery article 1 the first portions 6 of the sheets 2 arranged in a stack are folded along the folding line 4 onto the second portions 8 of the sheets 2, in a book-like configuration. Figure 4 shows a preferred condition wherein the tape 10 is applied onto the second face 6B, while the tape 12 is applied on the third face 8A. Such condition is preferably uniform for the whole stack of sheets 2, i.e. it regards each sheet 2. In this way, the tape 10, 12 will always be arranged at the (second and third) inner faces of the sheet portions 6, 8, thereby establishing a configuration in which the portions 6 are always provided with a first face without reinforcing tape 10, leaving a space on margin MI for possible notes or remarks (which would not be possible if tape 10 or 12 were present on margin M1, because such tapes typically comprise a polymeric material which cannot be wetted by common inks).

**[0023]** Reference 100 in Figure 5 generally denotes an apparatus for manufacturing sheets 2 for the stationery article 1 in some of the described embodiments, specifically wherein the first and second applications of tape material are arranged on the same face of sheet 2. Figure 8 shows, in association with reference to number 200, an apparatus for manufacturing the sheets 2 for the stationery article 1 in other described embodiments, specifically those comprising the first and second applications of tape material arranged on opposite faces of sheet 2. Both apparatuses 100 and 200 in the proposed structure share the same components and the related reference numbers. The description will therefore primarily refer to apparatus 100, while mentioning the differences in apparatus 200 only when needed.

**[0024]** The apparatuses 100, 200 are used herein a basis for the description of a method for manufacturing sheets 2 for the article 1 according to the invention. The depiction of apparatuses 100, 200 is deliberately schematic and does not show tools which are present in the practical implementation thereof, because the purpose of Figures 5, 8 is simply identifying the functional units of the apparatus, the implementation of such machines being largely known.

**[0025]** Apparatus 100 comprises:

- a feeding unit of a sheet material 102, configured for feeding a sheet material B wherefrom the sheets 2 are obtained. The feeding unit 102 is preferably implemented as a coil feeder, i.e. it is configured to operate with a coil of sheet material B;
- a first and a second feeding units of tape material 104, 106, each being configured for feeding a tape material L10, L12 (again, preferably wound in a coil) to one and the same face of the sheet material. From the tape material, tapes 10, 12 are obtained. In some embodiments, the feeding unit may be a single one, and the tape material may be fed with a double width; in such embodiments, a longitudinal cutting tool is provided for separating the tape material into two stripes which will later form the tapes 10, 12, directly downstream of the coil of tape material,
- a perforating unit 108, comprising a punch 108U and a die 108L, preferably both of them being rotative; however, solutions are possible wherein punch 108U performs a reciprocating movement,
- a die-cutting unit 110, comprising an upper die-cutting wheel 110U and a lower die-cutting wheel 110L, and
- a cutting unit 112, comprising either an upper cutting wheel 112U and a lower cutting wheel 112L, or a blade performing a reciprocating motion.

**[0026]** At the end of the apparatus a conveyor 114 is arranged which is configured for receiving a sheet 2 separated by the cutting unit 112, and for sending the sheet 2 to a collection tray 116.

**[0027]** The apparatus 200 differs from apparatus 100 only in that it comprises the feeding units 104, 106 being preferably arranged on opposite sides of the sheet material B, and being generally configured for feeding the first and the second tape materials to opposite faces of the sheet material B.

**[0028]** Apparatuses 100, 200 operate on the sheet material B fed by unit 102 in a process direction F, which in the present case is the same as the unwinding direction of sheet material B.

**[0029]** Sheet material B has a stripe width (i.e. the dimension along the winding/unwinding axis) which is equal to the dimension of sheet 2 transverse to the folding line (i.e. to the distance between the outer edges of margins ME), and has a predefined print of the typographic pattern of lines or squares.

**[0030]** As can be seen in Figures 7.1 and 10I, the sheet material B is fed with the margins ME being parallel to direction F. The margins MF and MS are not yet physically defined on the sheet material B, because they will be defined only downstream the sectioning of the single sheets 2 from the continuous flow of material B.

**[0031]** It must be kept in mind, in any case, that the sheet material B may be fed without having the printed line (or squared) typographic pattern which is visible in the Figures, and which may be printed in subsequent steps before cutting or even after cutting.

**[0032]** At point II in Figure 5, the tape materials L10, L12 are applied onto sheet material B: as can be seen in Figure 5, applying is performed on the same side or face of the sheet material B. For this purpose, the tape materials L10, L12 are provided with an adhesive layer, for a permanent connection with the sheet material B, wherein the adhesive layer is applied on the side of the

tape materials L10, L12 which directly faces the side of sheet B whereon the tape materials L10, L12 are applied. The tape materials L10, L12 are applied with an orientation corresponding to the process direction F, and therefore are parallel to each other.

**[0033]** The result of the application is visible in Figure 7.II: the tape materials L10, L12 are applied at the area of margins MI astride a reference line which corresponds to the folding line 4 (this will be obtained physically only in the following final sectioning into sheets 2). In this regard, the reference/folding line 4 may be defined or identified only virtually during the manufacturing of the stationery article 1, i.e. it must not necessarily be visible or identified through to an engraving in the sheet material (this engraving, however, may be provided to make folding easier), even though the latter measure may be implemented e.g. by means of a pair of engraving wheels, or by means of the same wheels which, at point II in figure 2, apply the tape materials L10, L12 onto sheet material B.

**[0034]** In apparatus 200, at point II (which in the present case preferably corresponds to a wider action area, because the tape materials L10, L12, for functional reasons, are preferably applied at positions which are slightly offset in the process direction) in Figure 8, the tape materials L10, L12 are applied on opposite faces of the sheet material B. To this end, the tape materials L10, L12 are provided with an adhesive layer for a permanent connection to the sheet material B, wherein the adhesive tape is applied on the side of the tape materials L10, L12 which directly faces the side of sheet B whereon the tape materials L10, L12 are applied. The tape materials L10, L12 are applied being oriented along the process direction F, and therefore are parallel to each other.

**[0035]** The result of the application is visible in figure 10.II: the tape materials L10, L12 are applied at the area of margins MI astride the reference line, which corresponds to the folding line 4 (the latter being actually formed only during the final sectioning into sheets 2). Also in this case, the reference/folding line 4, during the manufacturing of the stationery article 1, may be defined or identified only virtually, i.e. it must non necessarily be visible or defined by means of an engraving of the sheet material B (the latter engraving being provided e.g. to make folding easier), even though the latter operation is possible and may be carried out, e.g., by means of a pair of engraving wheels or by means of the same wheels which, at point II of Figure 8, apply the tape materials L10, L12 onto the sheet material B. The semi-finished product, comprising the sheet material B with the tape materials L10, L12 having already been applied thereon, keeps on advancing in direction F, and is therefore subjected, by means of unit 108, to the punching of a first pattern of holes 14 and of a second pattern of holes 16 into the tape materials L10, L12, respectively. The patterns of holes 14 and 16 are oriented along the process direction F, and are therefore parallel to each other. The result is visible in Figures 7.III and 10.III.

**[0036]** Downstream the perforation, the further advancement of the sheet material B along apparatus 100 reaches the die-cutting unit 110, which provides a first tear path T1 and a second tear path T2, the tear paths T1 and T2 each comprising a (through) dotted die-cutting. The tear paths T1, T2 are arranged between the tape material L10, L12 (whichever the face of sheet 2 whereon they are applied), respectively, and the reference/folding line 4, preferably directly adjoining the respective tape materials. Again, the tear paths T1 and T1 are oriented along the process direction F and therefore are parallel to each other. The result is visible in Figures 7.IV and 10.IV.

**[0037]** The semi-finished sheet material is now ready to be sent to the cutting unit 112, for sectioning a plurality of sheets 102 having a (predetermined) extension in direction F. The extension, which is predetermined by the size of the stationery article 1, equals the dimension of sheet 2 along reference line 4, i.e., equals the distance between the edges of margins MS and MF along line 4, and sectioning takes place across direction F. The result is visible in Figures 7.V and 10.V, wherein it may also be observed that, upstream the cutting, the sheet material B is still continuous, in the same way as the tapes L10, L12, the patterns of holes and the tear paths T1, T2, while downstream the cutting each sheet has:

- a section of the first tape material L10 and of the second tape material L12, respectively defining the first formation of tape material and the second formation of tape material of sheet 2 (i.e., the first tape 10 and the second tape 12),
- a section of the first tear path T1 and of the second tear path T2, respectively defining a first tear-off line 18 and a second tear-off line 20,
- a section of the first pattern of holes and of the second pattern of holes, which respectively define the first perforation P1 and the second perforation P2.

**[0038]** Referring to Figure 6 and Figure 9, the sheets 2 obtained by sectioning the sheet material B which has been processed by apparatus 100 are collected in tray 116 (or in a similar or equivalent collection station), and are organized in stacks lying on cover C, then they are coupled to the cover by means of staples S, which also couple together the sheets 2 in the stack. Figure 6 shows a configuration wherein the tapes 10, 12 are all arranged on the same side or face of the sheets 2, so that the first tape 10 and the second tape 12 of a sheet contact the side or face of a contiguous sheet which is opposite to the one having the respective first tape and 10 and the respective second tape 12, while Figure 9 shows a configuration wherein the tapes 10, 12 are arranged on opposite faces of the sheets 2, so that the first tape 10 and the second tape 12 of a sheet contact the side or face of a contiguous sheet whereon there are respectively provided the second tape 12 and the first tape 10.

**[0039]** Referring to Figures 12, 13, they show second

embodiments of the invention, wherein the sheets 2 (and generally speaking the stationery article 1) - which for the rest are perfectly identical to what has been previously described, so that the same reference numbers of Figures 1-11 are used to denote the same components and the same features - have the first and the second formations of tape material comprising a plurality of first isles of tape material 10B, 10C and second isles of tape material 12B, 12C, respectively. The isles 10B, 10C are arranged on an opposite side of the folding line 4 with respect to isles 12B, 12C, and the tear-off lines 18, 20 are arranged in a position respectively located between the isles 10B, 10C and the folding line 4, and between the isles 12B, 12C and the folding line 4.

**[0040]** In some of these embodiments, which are visible in Figure 12, the isles 10B, 12B are applied onto the same face of sheet 2. In other words, the isles 10B, 12B are applied on the second and third faces 6B, 8A (Figure 12), or on the first and fourth faces 6A, 8B (not shown, but obvious).

**[0041]** In other embodiments of this kind - see Figure 13 - the isles 10C, 12C are applied on opposite faces of sheet 2. In other words, the isles 10C, 12C are applied on the first and on the third faces 6A, 8A (Figure 13), or on the second and on the fourth faces 6B, 8B (not shown, but obvious).

**[0042]** Whatever pair of faces is subjected to applying the tapes 10, 12, in the embodiments the isles 10B, 10C and 12B, 12C are arranged along directions parallel to each other and parallel to the folding line 4.

**[0043]** The first perforation P1 is provided in the first sheet portion 6, and the second perforation P2 is provided in the second sheet portion 8, as described in the foregoing. Each of said first perforation P1 and second perforation P2 comprises a plurality of holes 14, 16 (so-called "filing holes") respectively going through the sheet 2 and the corresponding isles 10B, 10C and 12B, 12C, as shown in Figure 12 and in Figure 13 (and more generally going through the sheet 2 and the corresponding first or second formation of tape material). In other words, the holes 14, 16 go through the isles 10B, 10C and 12B, 12C, providing a configuration perfectly similar to a so-called "hole reinforcement", because the material of the isles 10B, 10C and 12B, 12C, in the same way as the material of the tapes 10, 12, is configured to prevent the accidental laceration of the holes 14, 16.

**[0044]** As described in the foregoing, the holes 14, 16 of each perforation P1, P2 are aligned along a direction parallel to the folding line 4, and they are arranged according to the most widespread configurations of rings available on the market. The Figures show a configuration with four holes 14, 16, but perforations are possible having two single holes or a mixed (universal) pattern, for adapting to any ring binder.

**[0045]** The characteristics of the applications of tape material of the second embodiments of sheets 2 lead to a corresponding variation of the apparatus employed for manufacturing the sheets 2 and the related stationery article 1.

**[0046]** In this respect, Figures 14 and 16 show apparatuses 300, 400 for manufacturing respectively the sheets 2 according to Figure 13 and the sheets 2 according to Figure 12.

**[0047]** Apparatuses 300, 400 are identical to apparatuses 200 and 100, except for the different configuration of the feeding units 104, 106. In these embodiments, they are provided with a tape material cutting unit, adapted to section the tape material L10, L12 into the plurality of isles 10B, 10C and 12B, 12C. The tape material cutting unit is moreover adapted to space the isles apart, so that they may be applied at a mutual distance in the process direction F onto the sheet material B. The feeding units 104, 106 are arranged on the same part of sheet B in apparatus 400, or anyway they are adapted to apply the tape material, in the present case by means of the tape material cutting units, on the same face of sheet material B. In apparatus 300, the feeding units 104, 106 are located on opposite parts of sheet B, or anyway they are adapted to apply the tape material, in the present case by means of the tape material cutting units, on opposite faces of sheet material B.

**[0048]** Each tape material cutting unit is essentially configured as a so-called cut-and-slip unit, known in itself, and by way of example it comprises a first wheel W1 carrying a cutting profile, a second wheel W2 (thus, the tape materials L1, L2 pass between the wheels W1 and W2) which acts as an anvil for the cutting profile of wheel W1 and, in a way known in itself, rotates with a circumferential speed which is higher than the speed of the tape material L1, L2, so as to space apart the isles 10B, 10C, 12B, 12C of tape material which have just been cut by wheel W1; the second wheel, in turn, has a side surface subjected to a negative pressure, in order to retain the isles having been cut on itself (typically for a limited angular extension).

**[0049]** The unit preferably comprises a further wheel W3, having the function of an applicator roller which receives the isles of material spaced apart from wheel W2, and retains them i.e. by means of vacuum (which again typically acts on a limited angular extension of the side surface) or by means of suction cups, until they are applied on the sheet material B. In some variations, in a way known in itself, it is possible to omit wheel W3 by applying the isles 10B, 10C and 12B, 12C directly on the sheet material B by means of wheel W2.

**[0050]** In practice, the tape material cutting units provided on the units 104, 106 operate by sectioning the tape material L1, L2 into isles 10C, 10B and 12C, 12B and by simultaneously spacing them apart before they are applied onto the sheet material B.

**[0051]** The remaining functional units operate in the same was as already described in the foregoing. Nevertheless, a brief description is presented for a better understanding.

**[0052]** As can be seen in Figures 18.I (corresponding to Figure 16) and 19.I (corresponding to Figure 14), the

sheet material B is fed with the margins ME being parallel to direction F. The margins MF and MS are not yet physically defined on the sheet material B, because they will be defined only downstream the sectioning of the single sheets 2 from the continuous flow of material B.

**[0053]** At point II in Figures 14 and 16, the tape materials L10, L12 are sectioned by means of the wheels W1, W2, W3, and the isles 10C, 10B and 12C, 12B are applied onto sheet material B in a mutually spaced apart position along the process direction F.

**[0054]** In apparatus 300, as can be seen in Figure 5, applying takes place on opposite faces of sheet 2, while in apparatus 400 applying takes place on one and the same face of sheet 2. To the purpose, the tape materials L10, L12, and as a consequence the isles obtained therefrom, are provided with an adhesive layer for a permanent connection to the sheet material B, wherein the adhesive layer is applied on the side of the tape materials L10, L12 directly facing the side of sheet B where the tape materials L10, L12 are applied. The isles 10C, 10B and 12C, 12B are applied while being oriented along the process direction F, and are therefore parallel to each other.

**[0055]** The result of the application is visible in Figures 18.II and 19.II: the isles 10C, 10B and 12C, 12B are applied at the area of margins M1 astride a reference line which corresponds to the folding line 4 (which is actually provided only with the final sectioning into sheets 2).

**[0056]** As described in the foregoing, while manufacturing the stationery article 1 the reference/folding line 4 may be identified or defined only virtually, i.e. it must not necessarily be identified or defined by an engraving into sheet material B (which however may be provided to make folding easier), although the latter possibility may be implemented, for example, by means of a pair of engraving wheels.

**[0057]** The semi-finished product, comprising the sheet material B with the tape material isles 10C, 10B and 12C, 12B applied thereon, further advances in direction F and is then subjected, by means of unit 108, to the punching of a first pattern of holes 14 and of a second pattern of holes 16 at the tape materials L10, L12, respectively. The patterns of holes 14 and 16 are oriented along the process direction F, and therefore are mutually parallel. The result may be seen in Figures 18.III and 19.III. The holes 14, 16 go through the corresponding isles 10C, 10B and 12C, 12B and through the sheet 2.

**[0058]** Downstream the perforation, the further advancement of the sheet material B along apparatus 100 leads to the die-cutting unit 110, which provides a first tear path T1 and a second tear path T2, the tear paths T1 and T2 each comprising a (through) dotted die-cutting. The tear paths T1, T2 are arranged between the corresponding first or second formation of tape material defined by isles 10C, 10B and 12C, 12B (whatever face of sheet 2 they are applied on), respectively, and the reference/folding line 4, preferably directly adjoining the respective applications of tape material. Again, the tear paths T1 and T1 are oriented along the process direction F and therefore are parallel to each other. The result can be seen in Figures 18.IV and 19.IV.

**[0059]** The semi-finished sheet material is now ready to be sent to the cutting unit 112, in order to be sectioned into a plurality of sheets 102 having a (predetermined) extension in direction F. The extension, which is predetermined by the size of the stationery article 1, equals the dimension of sheet 2 along reference line 4, i.e. the distance between the edges of margins MS and MF along line 4, and the sectioning takes place transversally of direction F. The result can be seen in Figures 18.V and 19.V, wherein it is also possible to observe that, upstream cutting, the sheet material B is still continuous, the pattern of holes and the tear paths T1, T2, while downstream cutting it is possible to identify, on each sheet,

- a section of the isles 10C, 10B of the first formation of tape material and a section of the isles 12C, 12B of the second formation of tape material, respectively defining the first formation of tape material (the group of isles 10C, 10B) and the second formation of sheet material (the group of isles 12C, 12B) of sheet 2,
- a section of the first tear path T1 and of the second tear path T2, respectively defining the first tear-off line 18 and the second tear-off line 20,
- a section of the first pattern of holes and of the second pattern of holes, respectively defining the first perforation P1 and the second perforation P2.

**[0060]** Referring to Figure 15 and Figure 17, the sheets 2 sectioned from the sheet material B processed by apparatus 100 are collected in tray 116 (or in a similar or equivalent collection station), and they are organized in stacks lying on cover C and coupled therewith by means of metal staples S, which also couple the sheets 2 in the stack with each other. Figure 17 shows a configuration wherein the isles 10C, 12B are all arranged on the same side or face of the sheets 2, so that the isles 10B of the first plurality and the isles 12B of the second plurality contact the side or face of a contiguous sheet opposite the one having the respective isles 10C and isles 12C. Figure 15 shows a configuration wherein the isles 10C of the first plurality and the isles 12C of the second plurality are arranged on opposite faces of sheets 2, so that the isles 10C and the isles 12C of a sheet contact the side or face of a contiguous sheet respectively having the isles 12C of the first plurality and the isles 10C of the second plurality.

**[0061]** Moreover, it must be borne in mind that the method according to the invention lends itself, in further embodiments, to the production of loose sheets (corresponding to the portions 6 and 8 of sheet 2) for ring binders, by providing a cut of sheet 2 along reference line 4, preferably after performing the cut by means of the unit 112, and, according to needs, by omitting (the sheet material B is processed as described in the foregoing, but it is sent to the cutting of sheets 2 in the conditions as per point III of Figures 7 and 10) or by re-positioning the

tear-off lines 18, 20 with respect to what has been observed for the embodiments already described in the foregoing (see Figure 20).

**[0062]** If the cut along reference line 4 is provided on the sheets 2 in the embodiments shown in Figures 12, 13 and in the related methods described with reference to Figures 16, 17, 18 and 14, 15, 19, and if at the same time the operations are omitted which provide the tear paths T1 and T2 (thus, the tear-off lines 18, 20 and the die-cutting unit 110), single sheets for ring binders are obtained the reinforcing function whereof on holes 14, 16 is performed by isles 10B, 10C and 12B, 12C, thereby significantly reducing the use of tape material in comparison to the solutions envisaging a continuous formation of tape material. In other words, in these embodiments the sheet material B is processed as described in the foregoing, but it is sent to the cutting of sheets 2 in the conditions as per point III of Figures 14, 16, 18, 19.

**[0063]** Moreover, the sheets thus obtained may be sold as loose sheets (in a ream or otherwise) or may be further processed in order to obtain a block of sheets with glue binding. In these instances, the tear-off lines 18, 20 are not required, because the separation of the single sheets takes place through the separation from the binding glue, while for loose sheets the problem of separation does not occur at all.

**[0064]** Of course it is possible, according to needs, to keep the presence of tear-off lines 18, 20, e.g. by producing a block having a glue binding and tear-off separable sheets. Moreover, further perforations may be provided in the band included between the tear-off lines 18, 20, so as to enable the use of the sheet portions 6, 8 as sheets of a spiral block, wherein the further perforations are configured to receive a spiral binding element.

**[0065]** Moreover, according to the invention it is possible to vary the position and/or the number of the tear-off lines 18, 20, so as to offer other possible binding solutions. For example, in alternative embodiments a single tear-off line 180 may be provided (Figure 20) at the upper margin MS, while omitting the tear-off lines 18, 30 and thereby obtaining a sheet 2 which may be divided along the reference line 4 into the two sheet portions 6, 8, which in turn may be bound by means of glue or a spiral along the margin MS. This enables obtaining a block wherein the binding and the tear-off lines are on a side other than the perforations providing the holes 14, 16. Figure 20 shows, always on the basis of the references I-V, the sequence of operations on the sheet material B in order to obtain such a sheet. The tear paths T1, T2 are replaced by a single tear path T, which is orthogonal to reference line 4 (Figure 20.IV*; the die-cutting unit 110 is replaced by a single-track die-cutting unit, transversal to reference line 4, hence the modified reference IV*), and is positioned in such a way that, when the material B has been sectioned by the cutting unit 112, the holes 14, 16 of perforations P1, P2 are on the same side of the tear path T, and consequently the tear-off line 180 on each sheet portion 6, 8, separated by cutting along reference line 4 (which may take place either before or after the cutting of material B into the sheets 2, preferably thereafter), is arranged so that the holes 14 or 16 are located on the same part thereof. As a further remark, the sequence of operations in Figure 20 is shown with reference to the sheets 2 of Figure 13, but obviously it can be applied to any sheet 2 described herein (Figures 1-11 and 12).

**[0066]** Therefore, on the basis of the various embodiments of the invention, a Method is defined for manufacturing the sheets 2 for the stationery article 1, comprising:

- feeding the sheet material B in the process direction F,
- applying a first formation of tape material and a second formation of tape material on opposite sides of a reference line 4 identified on the sheet material B,
- providing the first pattern of holes 14 at the first formation of tape material L10, and providing the second pattern of holes 16 at the second formation of tape material L12, each pattern of holes 14, 16 being oriented along the process direction F and going through the sheet material B and the corresponding formation of tape material,
- sectioning the sheet material B into a plurality of sheets 2 having an extension along the process direction F,

wherein said sectioning the sheet material identifies, on each sheet of said plurality:

- a section of the first formation of tape material and of the second formation of tape material, respectively defining the first formation of tape material and the second formation of tape material of sheet 2,
- a section of the first pattern of holes 14 and of the second pattern of holes 16, respectively defining the first perforation P1 and the second perforation P2 of the sheet.

**[0067]** In the embodiments of Figures 1 to 19 the method further comprises, prior to said sectioning the sheet material B into a plurality of sheets 2, providing on the sheet material B the first tear path T1 at a position between the first formation of tape material L10 and the reference line 4, and the second tear path T2 at a position between the second formation of tape material and the reference line (4). In this way, sectioning of the sheet material B into a plurality of sheets 2 identifies, on each sheet, a section of the first tear path T1 and of the second tear path T2, which respectively define the first tear-off line 18 and the second tear-off line 20 of sheet 2.

**[0068]** In the previously mentioned further embodiments, the method comprises cutting the sheets 2 along reference line 4; in such cases, the provision of the tear paths T1, T2 and of the tear-off lines 18, 20 may be envisaged, omitted or varied according to what has been described, depending on the article needed.

**[0069]** Generally speaking, the manufacturing of the

stationery article 1 may be performed directly on line on apparatuses 100, 200, 300, 400, including arranging the sheets 2 in a stack, applying staples S and optionally cover C, but these operations may also be performed off line, at separate stations and/or apparatuses. Applying cover C onto the plurality of stacked sheets 2 comprises coupling the cover C to the sheets 2 at the reference/folding line 4. Moreover, the method may comprise folding the stack of sheets along the reference/folding line 4 in order to define a notebook, which corresponds to the preferred embodiment of the stationery article 1.

**[0070]** Applying the cover may be performed simultaneously with the coupling of the sheets 2 in the stack, by binding the cover to the sheets 2 by means of the same staples S, or else the sheets 2 may be coupled by means of the staples S and the cover may be applied by means of a different binding technique, e.g. with glue. This means that the cover may be applied irrespective of the coupling of the sheets 2 in the stack.

**[0071]** The stationery article defined hereby unites the traditional advantages of a notebook, including the absence of a spiral and the related laceration risk of the binding perforation, the simplicity and convenience of the manufacturing method described in the foregoing, and the advantages of the stationery articles including tear-off sheets to be used in a ring binder. In the case of article 1, the separation of the sheets from the binding block - which essentially comprises the areas of the inner margins MI between the tear-off lines 18, 20 - takes place very easily and without risking the laceration of the sheet portions 6, 8, which would otherwise take place with blocks having a spiral binding. Very simply, the portions 6 and 8 may be removed as single perforated sheets for ring binders, and the provision of reinforcing tapes 10, 12 also leads to preventing laceration problems of the holes 14, 16 when the sheets are inserted into the ring binder.

**[0072]** In addition, thanks to the method according to the invention, the operations for manufacturing the stationery article 1 may be adopted, with very small modifications, for manufacturing single (loose) sheets to be used in ring binders, blocks with glue binding and even cardboard or paperboard dividers having holes 14, 16 which are reinforced by means of the formation of tape material isles 10C, 10B and 12C, 12B described in the foregoing, thereby saving a remarkable amount of plastic material as compared to the provision of continuous formations of tape material.

**[0073]** Of course, the implementation details and the embodiments may widely vary from what has been described and illustrated herein, without departing from the scope of the present invention as defined in the annexed claims.

## Claims

**1.** A stationery article (1) comprising a plurality of sheets (2) arranged in a stack and coupled together (S) at a folding line (4), each sheet (2) comprising:

- a first sheet portion (6) and a second sheet portion (8) arranged on opposite sides of said folding line (4), the first sheet portion (6) comprising a first face (6A) and a second face (6B) opposite to each other and the second sheet portion (8) comprising a third face (8A) and a fourth face (8B) opposite to each other,
- a first formation of tape material (10, 10B, 10C) applied to said first sheet portion (6) and a second formation of tape material (12, 12B, 12C) applied to said second sheet portion (8), said first formation of tape material (10, 10B, 10C) and said second formation of tape material (12, 12B, 12C) being arranged on opposite sides of said folding line (4),
- a first perforation (P1) provided in said first sheet portion (6) and a second perforation (P2) provided in said second sheet portion (8), the first perforation (P1) comprising a first plurality of holes (14) going through said sheet (2) and said first formation of tape material (10, 10B, 10C), the second perforation (P2) comprising a second plurality of holes (16) going through said sheet (2) and said second formation of tape material (12, 12B, 12C),
- a first and a second tear-off lines (18, 20) provided, respectively, on said first sheet portion (6) and said second sheet portion (8), wherein said first tear-off line (18) is arranged between said first formation of tape material (10, 10B, 10C) and said folding line (4), and wherein said second tear-off line (20) is arranged between said second formation of tape material (12, 12B, 12C) and said folding line (4), each of said first tear-off line (18) and said second tear-off line (20) being configured for the separation, respectively, of said first sheet portion (6) and said second sheet portion (8) from said sheet (2).

**2.** The stationery article according to Claim 1, wherein said first formation of tape material (10) comprises a first tape continuously extending along said first sheet portion (6), and wherein said second formation of tape material comprises a second tape (12) continuously extending along said second sheet portion (8).

**3.** The stationery article (1) according to Claim 2, wherein said first tape (10) and said second tape (12) are applied parallel to each other.

**4.** The stationery article (1) according to Claim 1, wherein said first formation of tape material comprises a first plurality of isles (10B, 10C) of tape material, and wherein said second tape material formation

comprises a second plurality of isles (12B, 12C) of tape material.

**5.** The stationery article (1) according to Claim 4 wherein each hole (14) of the first perforation goes through a corresponding isle of the first plurality of isle of tape material (10B, 10C), and wherein each hole (16) of the second perforation goes through a corresponding isle of the second plurality of isles of tape material (12B, 12C).

**6.** The stationery article (1) according to Claim 4 or Claim 5, wherein the first plurality of isles of tape material (10B, 10C) and the second plurality of isles of tape material (12B, 12C) are aligned along directions parallel to the folding line (4).

**7.** The stationery article (1) according to Claim 1, wherein the first sheet portions (6) of the sheets (2) of said plurality are folded along said folding line (4) onto the second sheet portions (8) of the sheets (2) of said plurality.

**8.** The stationery article (1) according to any one of the previous claims, wherein the first perforation (P1) and the second perforation (P2) comprise a plurality of holes (14, 16) aligned along a direction parallel to the folding line (4).

**9.** The stationery article (1) according to any one of the previous claims, wherein the first formation of tape material (10, 10B, 10C) is arranged on the second face (6B) and the second formation of tape material (12, 12B, 12C) is disposed on the third face (8A).

**10.** The stationery article (1) according to any one of Claims 3, 4, wherein the first formation of tape material (10, 10B, 10C) is arranged on the first face (6B) and the second formation of tape material (12, 12B, 12C) is arranged on the third face (8A).

**11.** A method for making sheets (2) for a stationery article (1), comprising:

- feeding a sheet material (B) in a process direction (F),
- applying a first formation of tape material (L10, 10B, 10C) and a second formation of tape material (L12, 12B, 12C) onto said sheet material (B) on opposite sides of a reference line (4) identified on said sheet material (B),
- providing a first pattern of holes (14) at said first formation of tape material (L10, 10B, 10C) and providing a second pattern of holes (16) at said second formation of tape material (L12, 12B, 12C), each pattern of holes (14, 16) being oriented according to the process direction (F) and going through said sheet material (B) and the corresponding formation of tape material (L10, 10B, 10C; L12, 12B, 12C),
- sectioning the sheet material (B) into a plurality of sheets (2) for a stationery article (1) having an extension along the process direction (F),

wherein said sectioning the sheet material identifies, on each sheet (2) of said plurality:

- a section of said first formation of tape material and of said second formation of tape material defining, respectively, the first formation of tape material (10, 10B, 10C) and the second formation of tape material (12, 12B, 12C) of said sheet (2),
- a section of said first hole pattern (14) and said second hole pattern (16) defining, respectively, said first perforation (P1) and said second perforation (P2) of the sheet.

**12.** The method according to Claim 11, further comprising, prior to said sectioning said sheet material (B) into a plurality of sheets (2), providing on said sheet material (B) a first tear path (T1) at a position between said first formation of tape material (L10, 10B, 10C) and said reference line (4), and a second tear path (T2) in a position between said second formation of tape material (L12, 12B, 12C) and said reference line (4),
wherein, moreover, said sectioning of said sheet material (B) identifies, on each sheet (2) of said plurality, a section of said first tear-off path (T1) and said second tear-off path (T2) defining, respectively, a first tear-off line (18) and a second tear-off line (20) of said sheet, each of said first tear-off line (18) and said second tear-off line (20) being configured respectively for the separation of a first sheet portion (6) and a second portion sheet portion (8) from said sheet (2), the first sheet portion and the second sheet portion being arranged on opposite sides of said reference line (4).

**13.** The method of Claim 11 or claim 12, further comprising arranging the sheets (2) of the plurality in a stack and coupling said sheets (2) along said reference line (4).

**14.** The method of Claim 11 or claim 12, further comprising applying a cover (C) to the plurality of sheets (2) arranged in a stack, said applying a cover comprising coupling the cover (C) to the sheets (2) at the reference line (4).

**15.** The method of Claim 11 or Claim 12, wherein the first formation of tape material (L10, 10B, 10C) and the second formation of tape material (L12, 12B, 12C) are arranged on a same face of said sheet material (B).

16. The method of Claim 11 or Claim 12, wherein the first formation of tape material (L10, 10B, 10C) and the second formation of tape material (L12, 12B, 12C) are arranged on opposite faces of said sheet material (B).

17. The method of any one of Claims 11 to 16, wherein said first formation of tape material (L10, 10B, 10C) and said second formation of tape material (L12, 12B, 12C) extend continuously along said sheet material (B).

18. The method of any of Claims 11 to 16, wherein said applying a first formation of tape material (L10, 10B, 10C) comprises feeding a first tape material (L10), sectioning the first tape material into a plurality of first isles (10B, 10C) of material in tape, spacing the first isles of tape material (10B, 10C) in the process direction (F) and applying the first isles of tape material (10B, 10C) onto the sheet material (B) spaced in the process direction (F), and
wherein said applying a second formation of tape material (L12, 12B, 12C) comprises feeding a second tape material (L12), sectioning the second tape material (L12) into a plurality of second isles (12B, 12C) of tape material, and applying the second isles of tape material (12B, 12C) onto the sheet material (B) spaced in the process direction (F).

19. The method of any of Claims 11 to 18, further comprising cutting said sheet (2) along the reference line (4).

20. The method of any of Claims 11 and 13 to 19, further comprising, prior to said sectioning said sheet material (B) into a plurality of sheets (2), providing onto said sheet material (B) a tear path (T1) orthogonal to said reference line, said tear path being arranged on said sheet so that the holes of said first perforation and the holes of said second perforation are arranged on the same side with respect to said tear path,
wherein, moreover, said sectioning the sheet material identifies, on each sheet (2) of said plurality, a section of said tear-off path defining a tear-off line of said sheet (2).

21. A sheet (2) for a stationery article (1) comprising:

- a first sheet portion (6) and a second sheet portion (8) arranged on opposite sides of a reference line (4), the first sheet portion (6) comprising a first face (6A) and a second face (6B) opposite to each other and the second sheet portion (8) comprising a third face (8A) and a fourth face (8B) opposite to each other,
- a first formation of tape material (10, 10B, 10C) on said first sheet portion (6) and a second formation of tape material (12, 12B, 12C) on said second sheet portion (8) said first formation of tape material (10, 10B, 10C) and said second formation of tape material (12, 12B, 12C) being arranged on opposite sides of said reference line (4),
- a first perforation (P1) provided in said first sheet portion (6) and a second perforation (P2) provided in said second sheet portion (8), the first perforation (P1) comprising a first plurality of holes (14) going through said sheet (2) and said first formation of tape material (10, 10B, 10C), the second perforation (P2) comprising a second plurality of holes (16) going through said sheet (2) and said second formation of tape material (12, 12B, 12C).

22. The sheet for stationery article according to Claim 21, further comprising a first and a second tear lines (18, 20) provided, respectively, on said first sheet portion (6) and said second sheet portion (8), wherein the first tear line (18) is arranged between said first formation of tape material (10, 10B, 10C) and said reference line (4), and wherein said second tear-off line (20) is arranged between said second formation of tape material (12, 12B, 12C) and said reference line (4), each of said first tear-off line (18) and said second tear-off line (20) being configured respectively for the separation of said first sheet portion (6) and said second sheet portion (8) from said sheet (2).

23. A sheet for a stationery article that can be manufactured by a method according to Claim 18.

24. A sheet for a stationery article that can be manufactured by a method according to Claim 19.

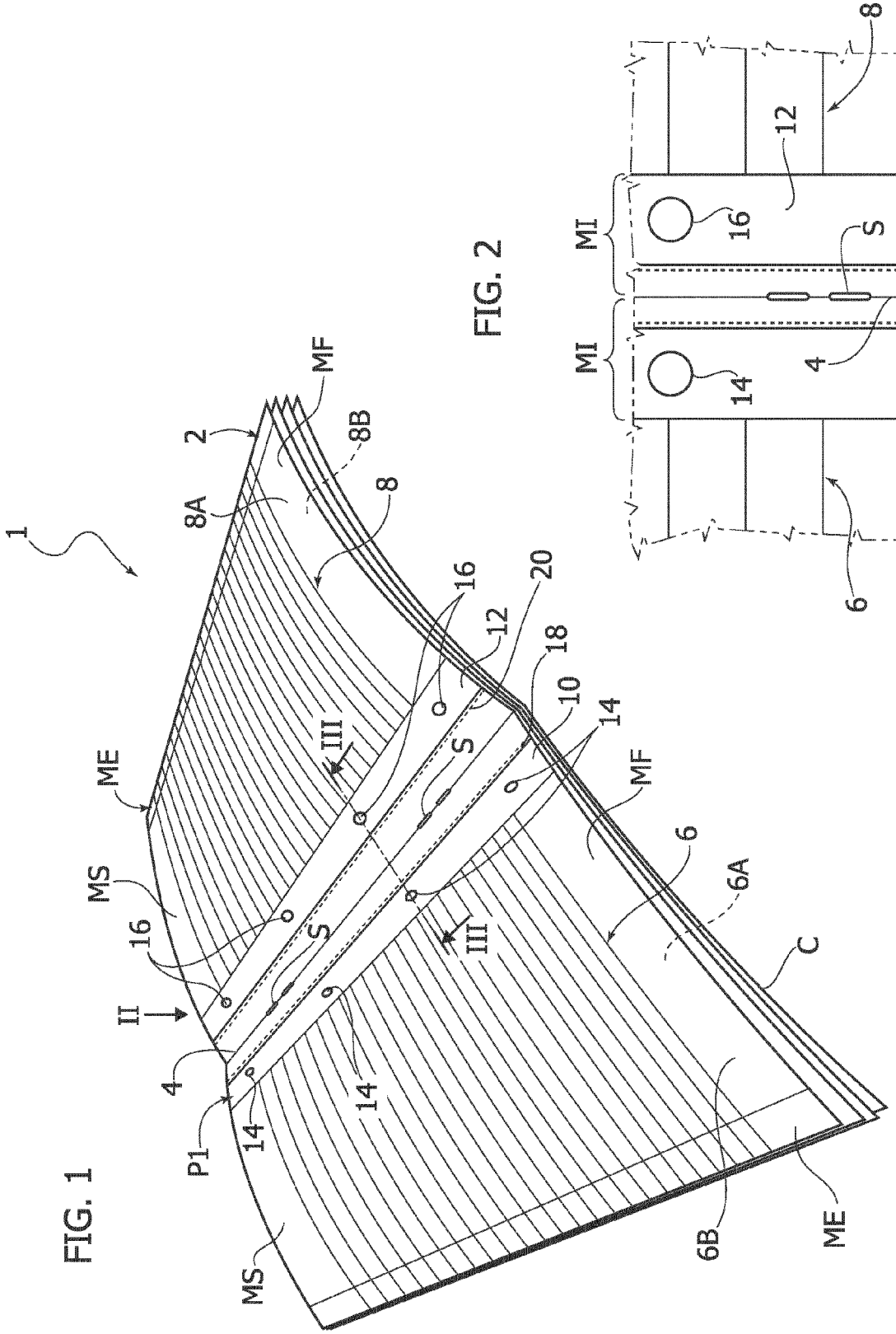

1
2
8A
8B
8
MF
ME
MS
16
12
20
18
10
14
S
III
III
II
4
P1
6
6A
6B
C

FIG. 1

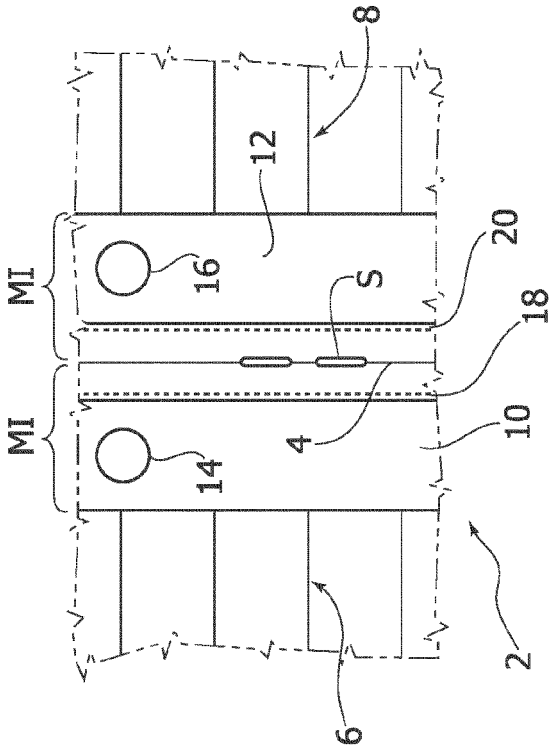

8
12
16
MI
MI
S
20
18
4
10
14
6
2

FIG. 2

FIG. 3

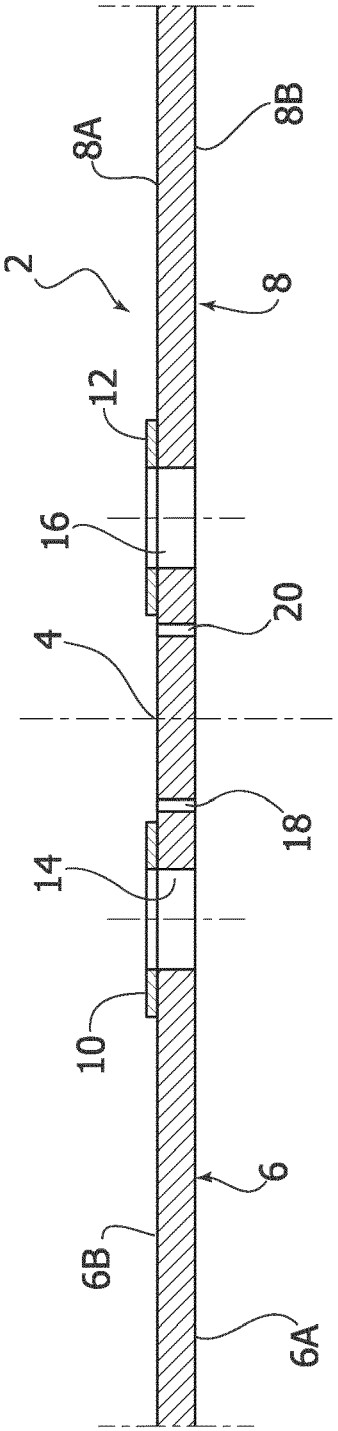

2
8A
8B
8
12
16
20
4
18
14
10
6
6B
6A

FIG. 4

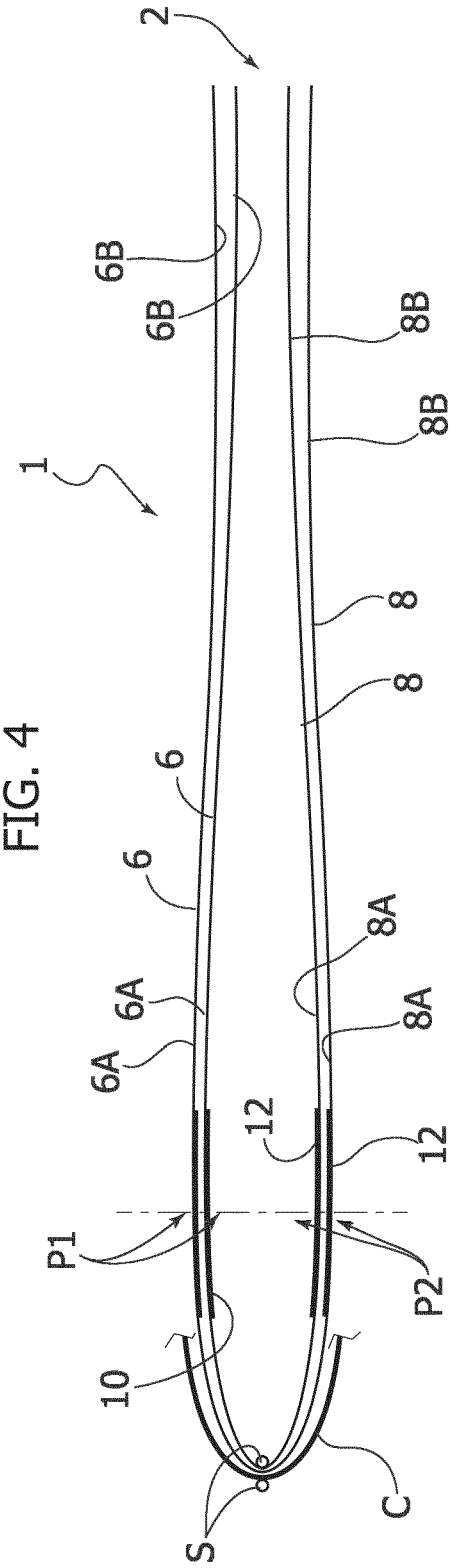

2
6B
6B
8B
8B
1
8
8
6
6
8A
6A
8A
6A
12
12
P1
P2
10
C
S

FIG. 5

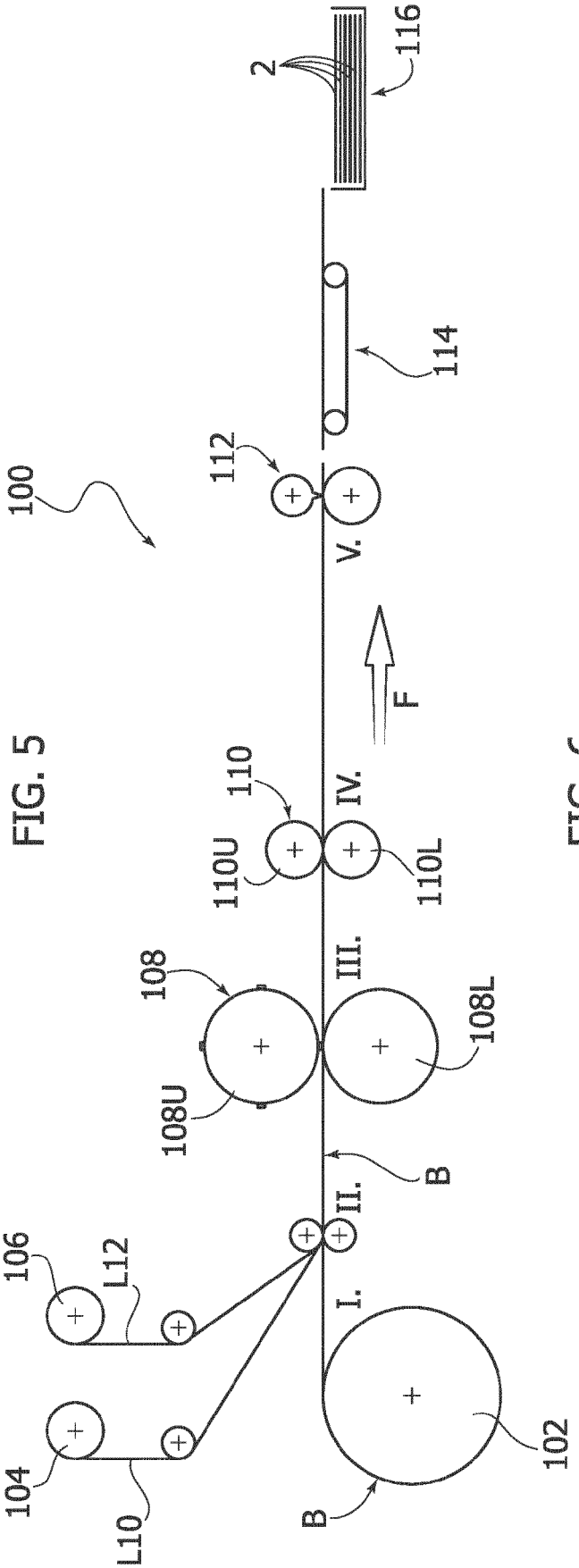

100
2
116
114
112
V.
F
110
IV.
110U
110L
108
III.
108L
108U
B
II.
106
L12
I.
104
L10
B
102

FIG. 6

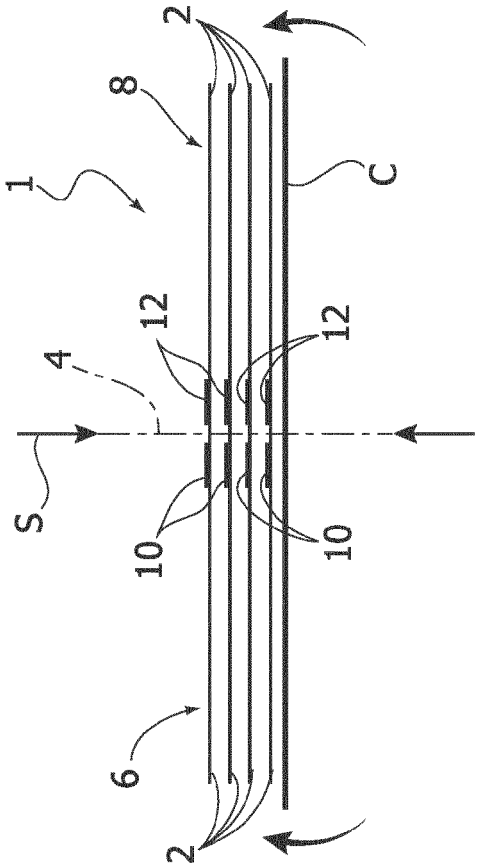

2
8
1
C
12
12
4
S
10
10
6
2

FIG. 7

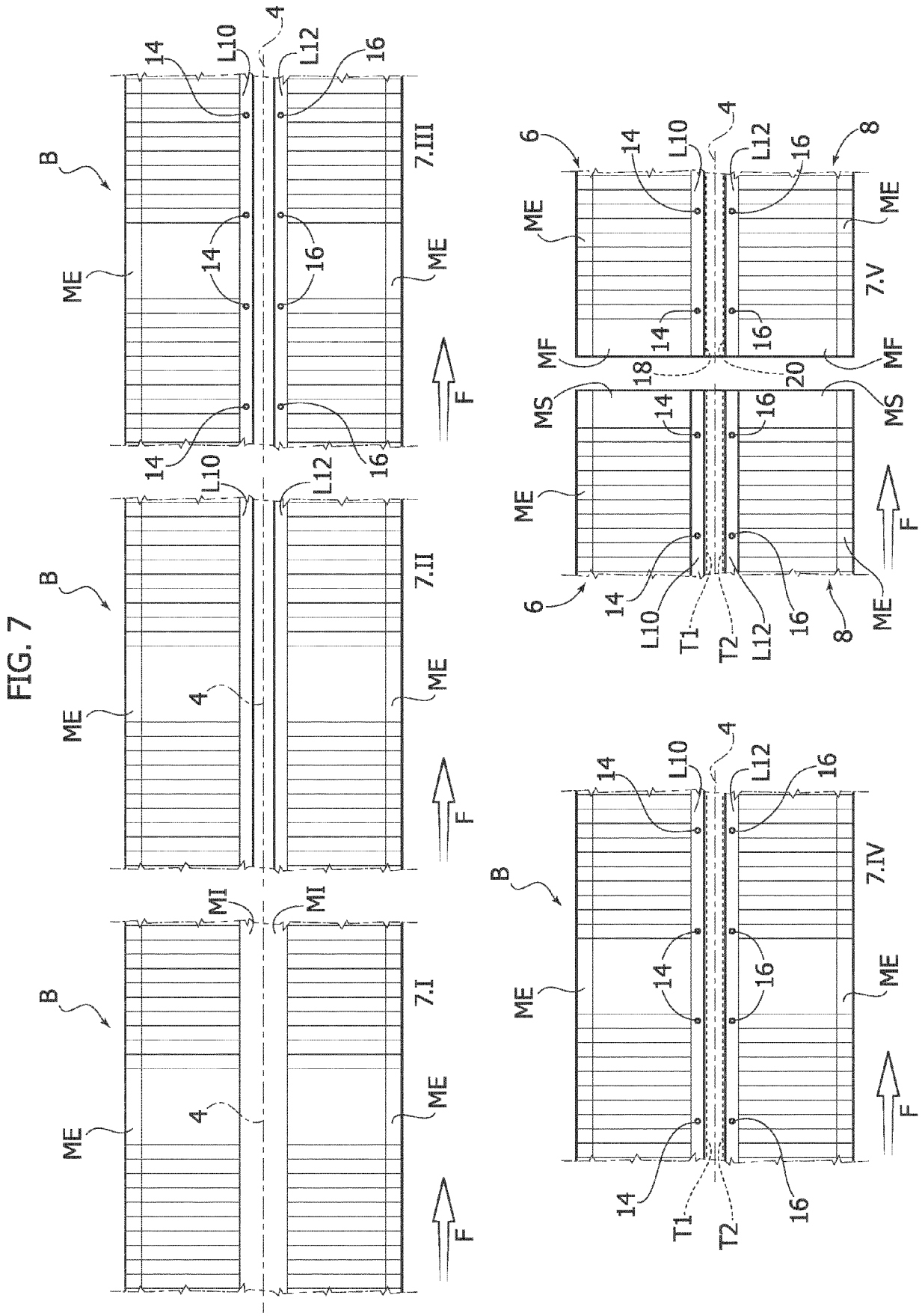


FIG. 8

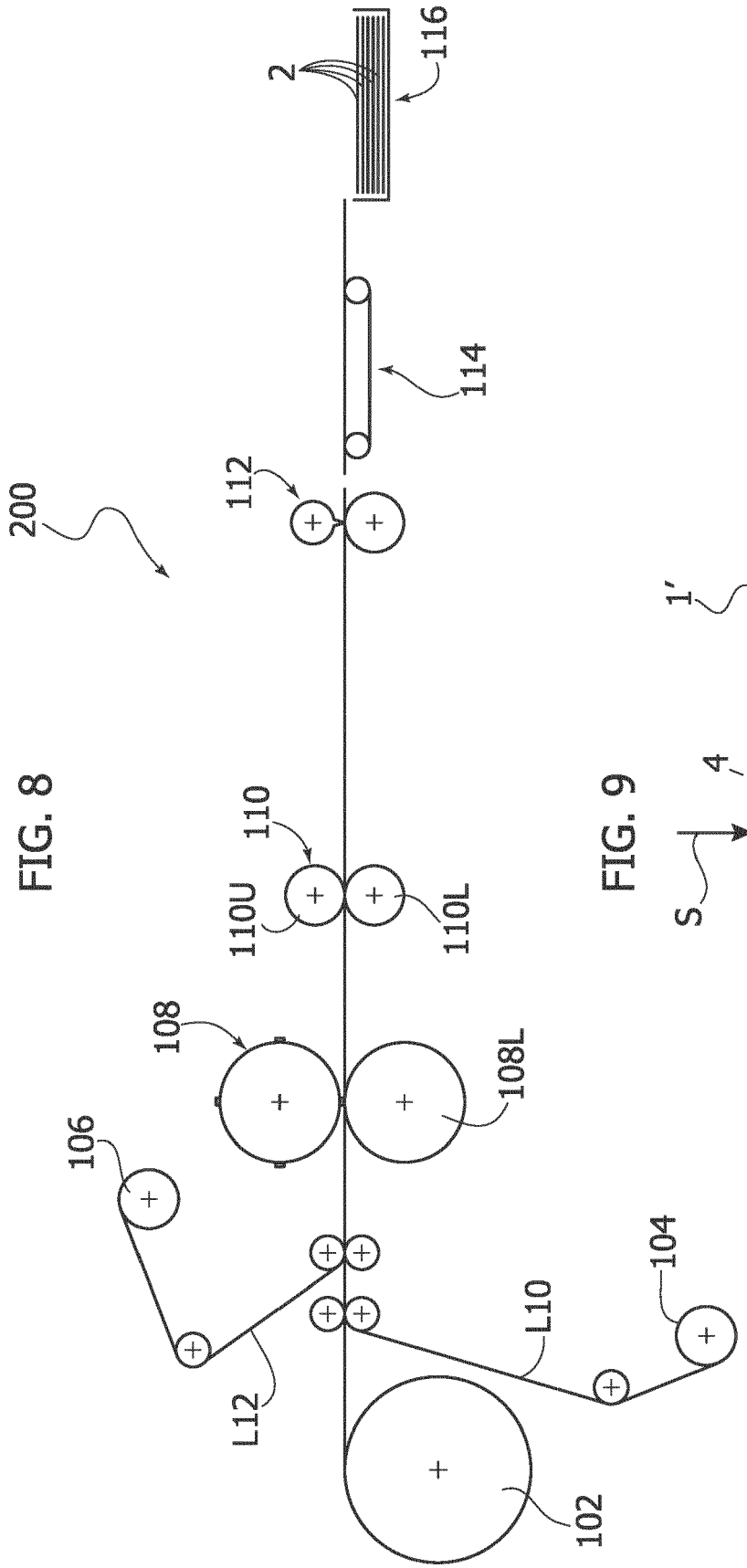

200
2
116
114
112
110
110U
110L
108
108L
106
L12
L10
104
102

FIG. 9

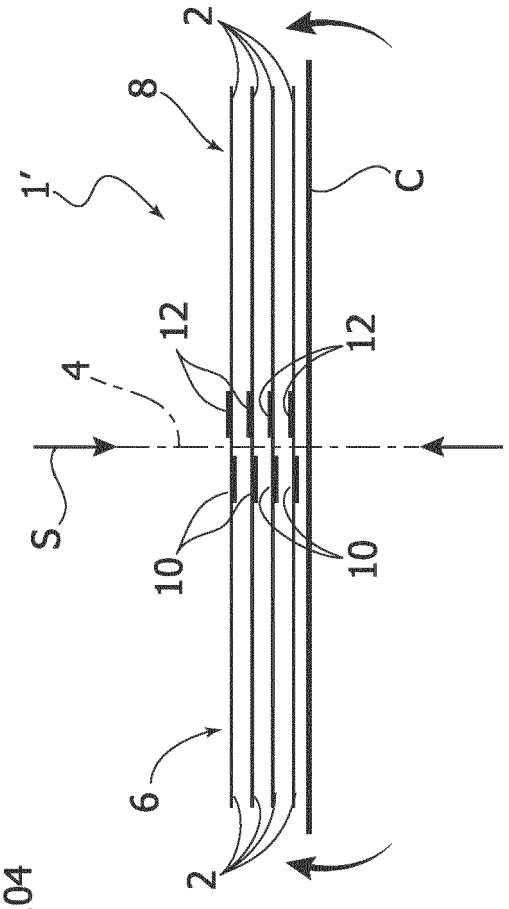

1'
2
8
C
12
12
4
S
10
10
6
2

FIG. 10

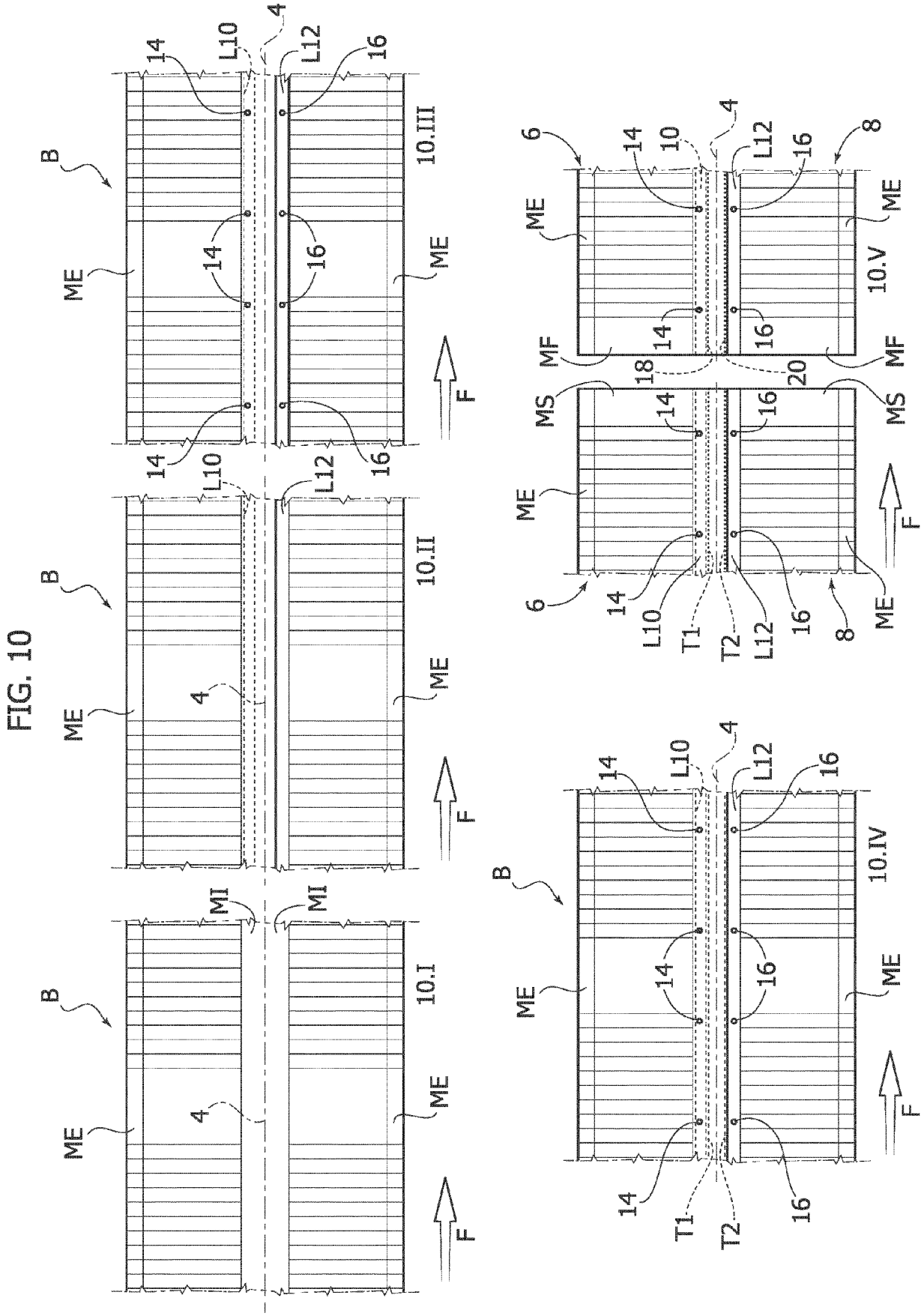

B
ME
MI
4
14
16
L10
L12
10.I
10.II
10.III
10.IV
10.V
F
6
8
10
18
20
MF
MS
T1
T2

FIG. 11

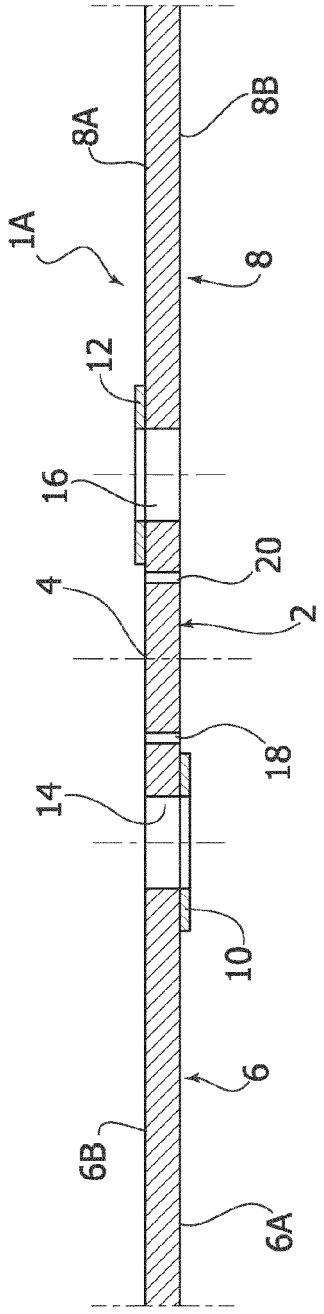



FIG. 13

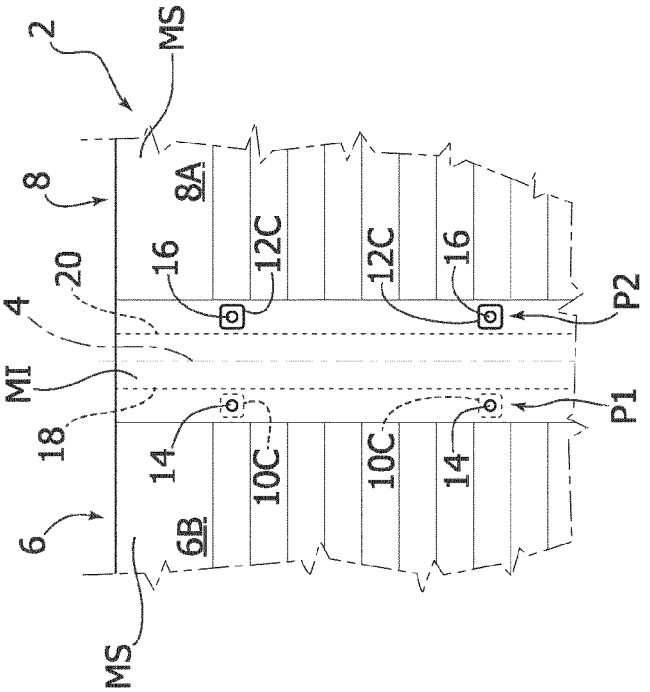
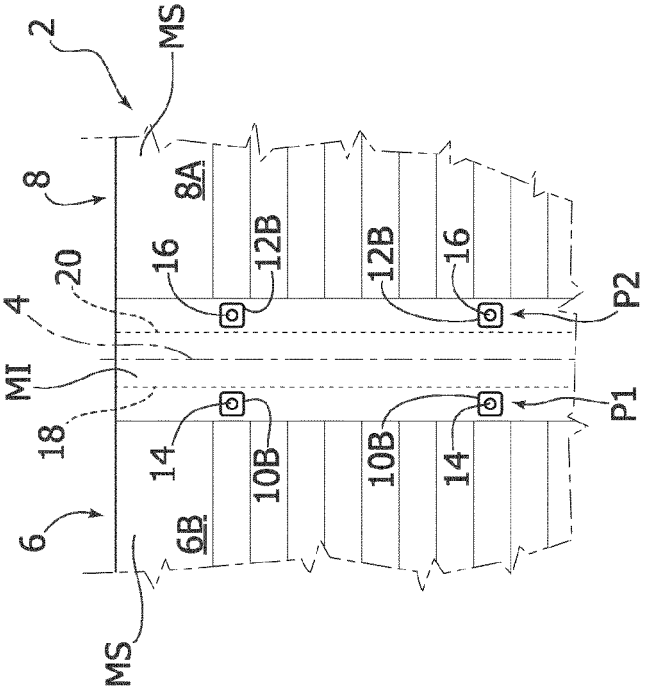



FIG. 12



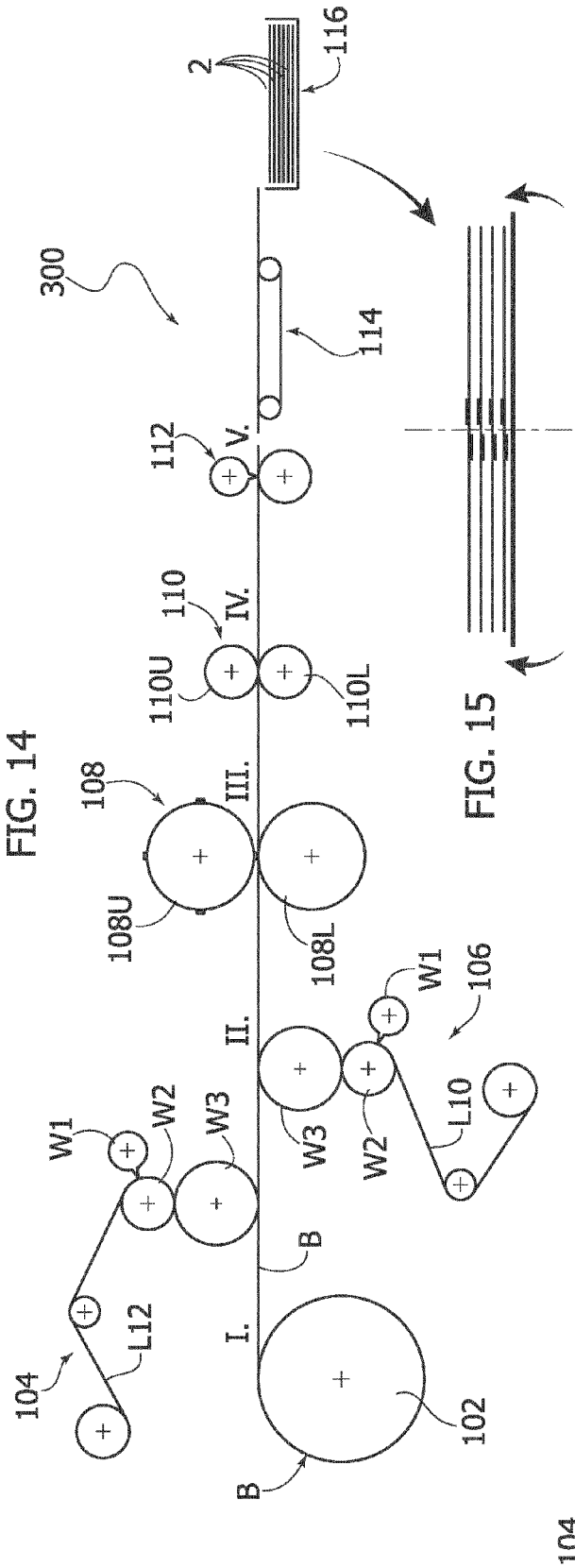



FIG. 14

FIG. 15

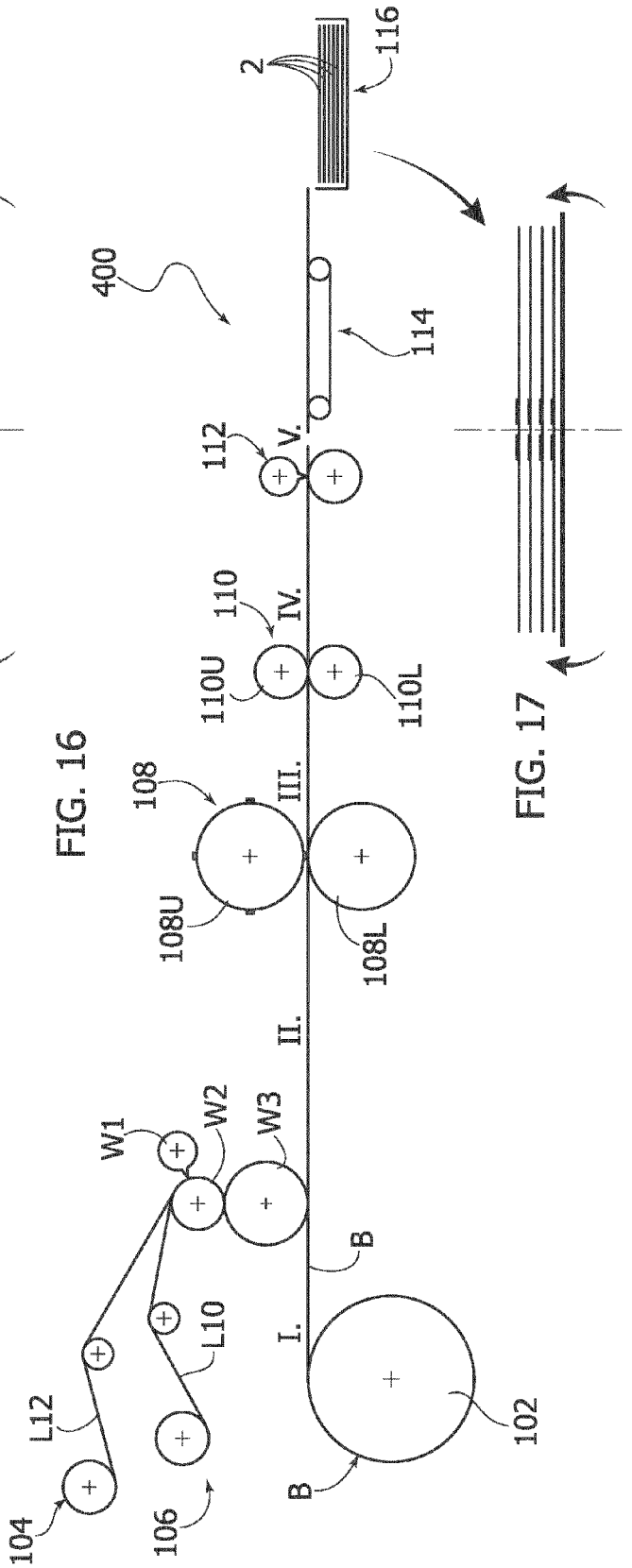
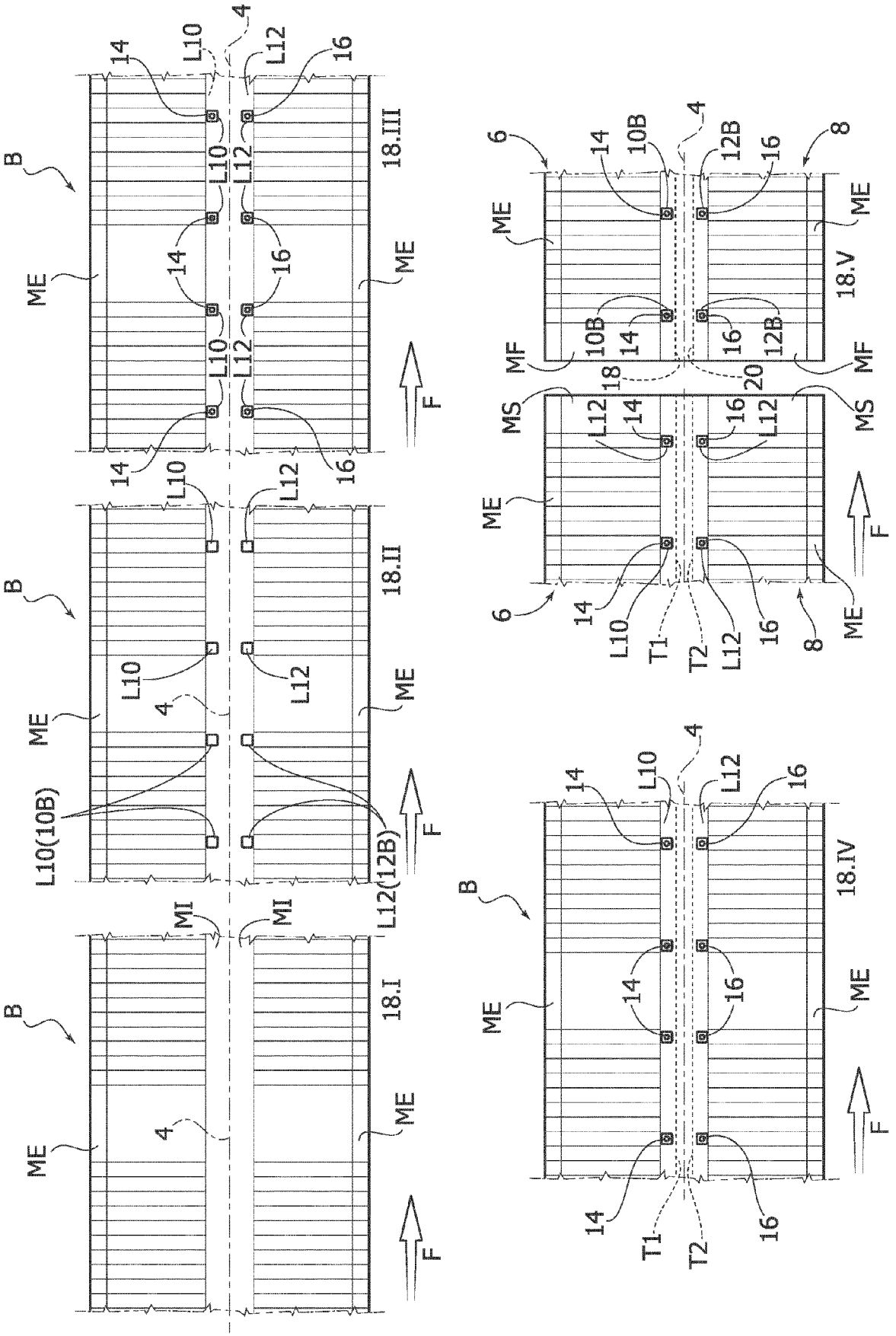



FIG. 16

FIG. 17

FIG. 18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L10
L12
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18.II
18.I
18.IV
18.V
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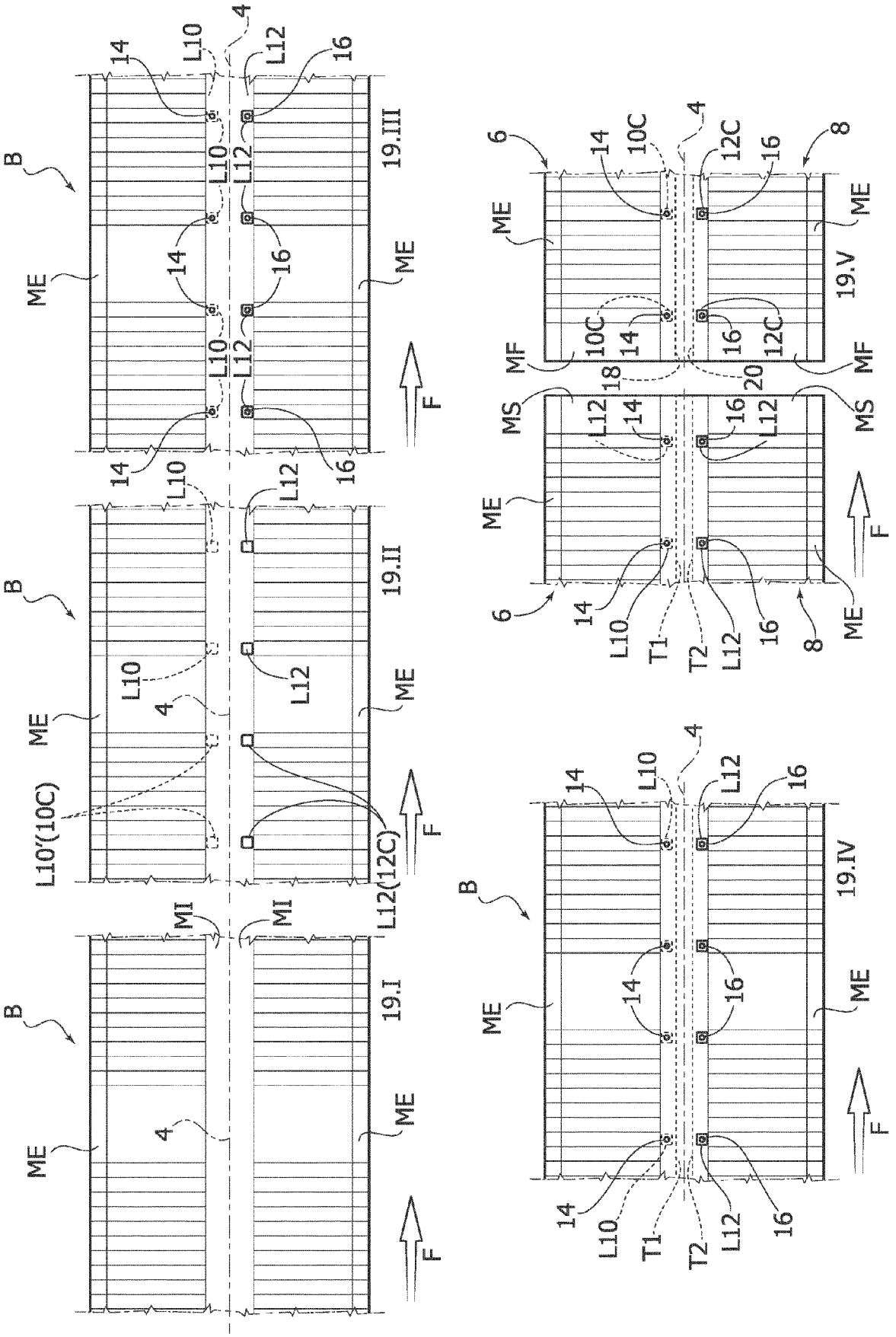
L12(12B)
MI
F
6
8
10B
12B
MF
MS
18
20
T1
T2

FIG. 19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L10
L12
16
19.III
19.II
19.I
19.IV
19.V
L10'(10C)
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MI
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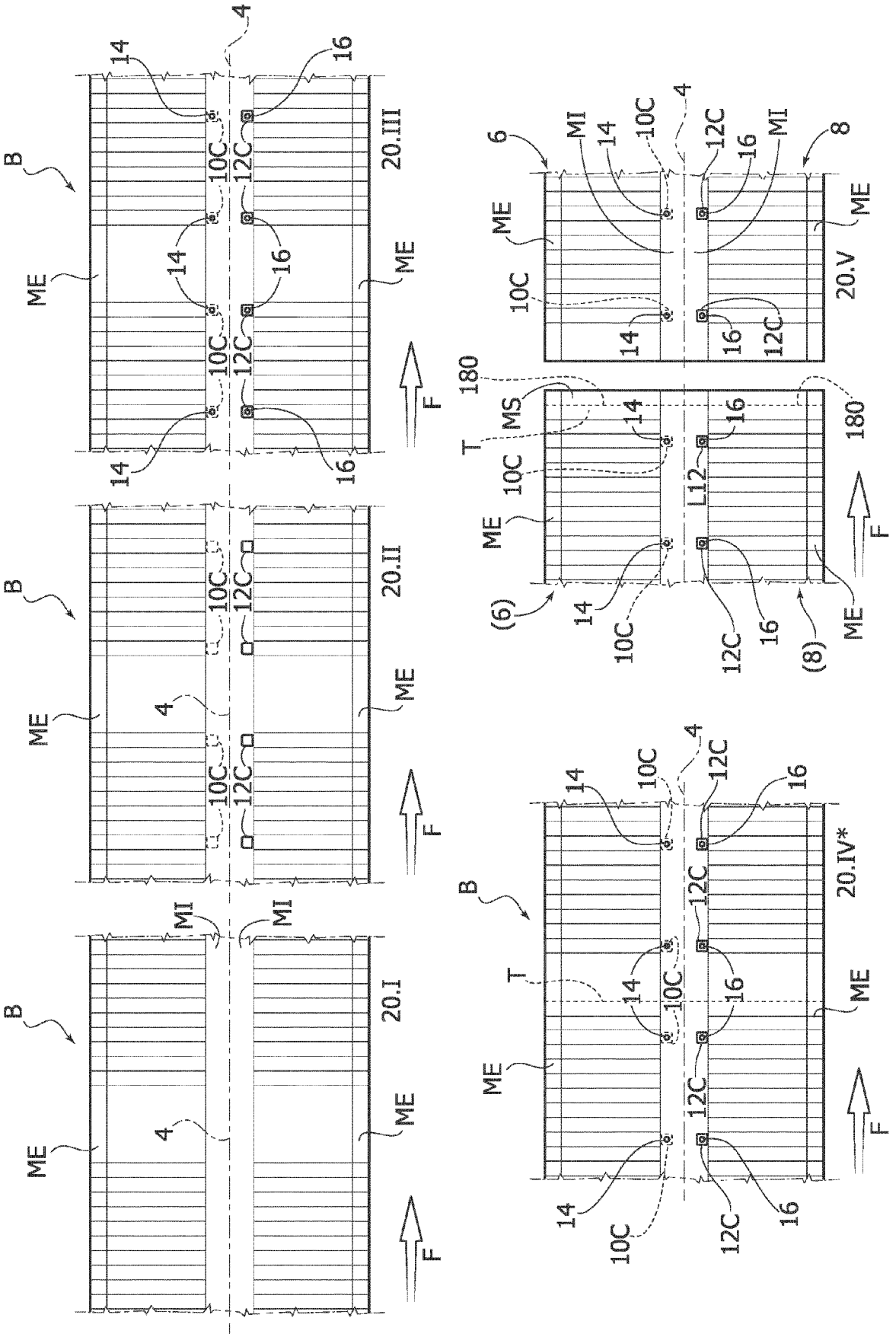
12C
18
20
MF
MS
T1
T2

FIG. 20



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# EUROPEAN SEARCH REPORT

Application Number
EP 22 20 6497

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| Y | US 5 299 833 A (MADOLE JR RICHARD F [US]) 5 April 1994 (1994-04-05) * abstract; figure 1 * * column 2, line 60 - column 4, line 39; claims * | 1-24 | INV. B42D1/00 B42D5/00 B42D5/02 |
| Y | GB 285 225 A (ERNEST GEORGE NIXON; LAMSON PARAGON SUPPLY CO LTD) 16 February 1928 (1928-02-16) * the whole document * | 1-24 | |
| A | GB 1 258 423 A (LAMSON PARAGON LIMITED) 30 December 1971 (1971-12-30) * abstract; figure 1 * | 1-24 | |
| A | US 5 948 494 A (LEVIN HERBERT L [US]) 7 September 1999 (1999-09-07) * column 3, lines 14-43; figure 8 * | 1-24 | |
| Y | US 2013/306715 A1 (JAMES JR BOBBY G [US] ET AL) 21 November 2013 (2013-11-21) * paragraphs [0053] - [0058]; figure 13 * | 1-24 | TECHNICAL FIELDS SEARCHED (IPC) B42D |
| A | KR 2010 0037337 A (SON KWANG HUN [KR]) 9 April 2010 (2010-04-09) * paragraphs [0050] - [0052]; figure 9 * | 1-24 | |
| A | FR 2 418 092 A1 (MOORE BUSINESS FORMS INC [US]) 21 September 1979 (1979-09-21) * page 3, line 1 - page 4, line 24; figure 1 * | 1-24 | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 27 January 2023 | Zacchini, Daniela |

CATEGORY OF CITED DOCUMENTS

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27-01-2023

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 5299833 A | 05-04-1994 | AU 669234 B2 | 30-05-1996 |
| | | CA 2115010 A1 | 27-10-1994 |
| | | JP 2521412 B2 | 07-08-1996 |
| | | JP H06320888 A | 22-11-1994 |
| | | US 5299833 A | 05-04-1994 |
| GB 285225 A | 16-02-1928 | NONE | |
| GB 1258423 A | 30-12-1971 | NONE | |
| US 5948494 A | 07-09-1999 | AU 4007199 A | 12-12-2000 |
| | | US 5948494 A | 07-09-1999 |
| | | WO 0071335 A1 | 30-11-2000 |
| US 2013306715 A1 | 21-11-2013 | CA 2816491 A1 | 21-11-2013 |
| | | US 2013306715 A1 | 21-11-2013 |
| | | US 2014339805 A1 | 20-11-2014 |
| | | US 2018290482 A1 | 11-10-2018 |
| | | WO 2013177113 A1 | 28-11-2013 |
| KR 20100037337 A | 09-04-2010 | NONE | |
| FR 2418092 A1 | 21-09-1979 | AT 383312 B | 25-06-1987 |
| | | AU 528438 B2 | 28-04-1983 |
| | | CH 637883 A5 | 31-08-1983 |
| | | DE 2907154 A1 | 06-09-1979 |
| | | DK 57179 A | 24-08-1979 |
| | | ES 251112 U | 01-07-1981 |
| | | FI 790504 A | 24-08-1979 |
| | | FR 2418092 A1 | 21-09-1979 |
| | | GR 66889 B | 08-05-1981 |
| | | IE 47993 B1 | 22-08-1984 |
| | | IT 1123987 B | 07-05-1986 |
| | | LU 80955 A1 | 07-09-1979 |
| | | NL 7901097 A | 27-08-1979 |
| | | NO 151080 B | 29-10-1984 |
| | | NZ 189735 A | 30-03-1982 |
| | | PT 69204 A | 01-03-1979 |
| | | SE 430868 B | 19-12-1983 |

EPO FORM P0459

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