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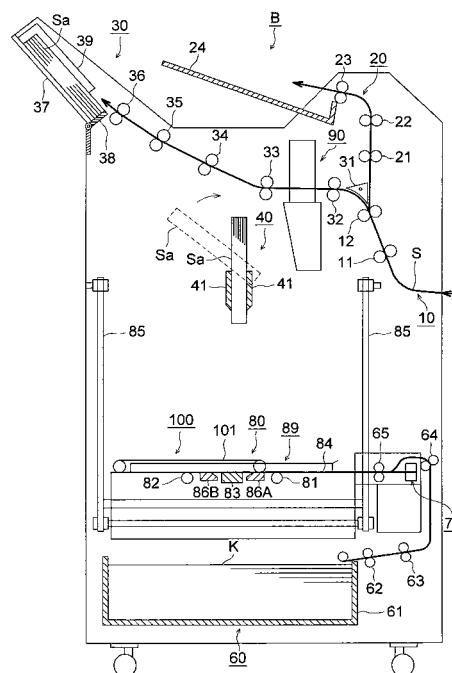
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(54) **Bookbinding apparatus and image forming system**

(57) A bookbinding apparatus (B) for providing wrap-ping-binding of a booklet by bonding a cover sheet (K) on the spine portion of a sheet bundle (5a) to wrap the sheet bundle (5a) with the cover sheet (K), wherein the sheet conveyance path of the bookbinding apparatus includes a notch forming device (90) to form notches (V) on the end side to be coated with adhesive when the sheet (S) is subjected to bookbinding process.

FIG. 3



Description

[0001] This application is based on Japanese Patent Application No. 2005-251000 filed on August 31, 2005 in Japanese Patent Office, the entire content of which is hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to a bookbinding apparatus that makes a booklet by covering the spine portion, the front and the back of the bundle of sheets with a cover sheet, and in particular, to an image forming system equipped with a bookbinding apparatus which can be connected to an image forming apparatus body such as a copying machine, a facsimile machine or a printer to be applied.

[0003] Bookbinding is known as a method of binding a bundle of sheets as a collection of printed sheets by stapling or pasting.

[0004] Apparatuses known as a pasting and bookbinding apparatus include a device to jet paste on a sheet by using a paste jetting nozzle, a device wherein a paste roller is installed in a paste container, and paste adheres to an outer circumference of the rotating paste roller to be transferred onto a sheet when the outer circumference of the rotating paste roller touches the sheet, a hot-melt coating device that jets a mixture containing hot-melt agents (heat fusing agents) and heated and compressed air from a nozzle, and a tape sticking device that sticks a tape on which adhesive paste is coated in advance on the spine portion of a sheet bundle while the tape is heated.

[0005] According to the conventional bookbinding art, it is a common practice to form multiple notched grooves on the end side of a sheet bundle by using a milling machine which is independent of a bookbinding apparatus, and then to apply adhesive to the end side of the sheet bundle by using the bookbinding apparatus, whereby a booklet is bound.

[0006] A recent image forming apparatus based on electrophotographic technology is characterized by high speed, multi-function performance and network functions. Its applications as a printing apparatus are much increased when it is connected with a large-capacity sheet feeding apparatus and a large-capacity stacker.

[0007] When an image forming apparatus is used as a printing apparatus, all the operations ranging from printing to binding can be performed by one apparatus if connected with a bookbinding apparatus for binding printed matter.

[0008] When the pasting and bookbinding apparatus disclosed in the Patent Document 1 is used, the strength of the booklet having been pasted and bound is insufficient due to the limited pasting area on the spine portion of a sheet bundle.

[0009] In a bookbinding apparatus wherein multiple notched grooves are formed on the end side of a sheet

bundle using a milling machine, and adhesive is then applied to the end side of the sheet bundle having notched grooves thereon, there remain the problems of an increased apparatus size and increased production costs if the milling machine is incorporated in the bookbinding apparatus, because of the large size of the milling machine. These problems will lead to drawbacks in an image forming system which includes a directly coupled bookbinding apparatus wherein an image forming apparatus is used as a printing apparatus.

[Patent Document 1] Unexamined Japanese Patent Application Publication No. 2004-209869

SUMMARY

[0010] This invention includes a bookbinding apparatus and an image forming system which will be described below.

(1) A bookbinding apparatus for bonding a cover sheet to an end portion of a bundle of sheets and for producing a booklet by wrapping the bundle of sheets with the cover sheet, the bookbinding apparatus includes a notch forming mechanism for forming notches, before each sheet is formed into the bundle of sheets, on an end side of the each sheet to be coated with adhesive.

(2) An image forming system including an image forming apparatus body having an image forming section for forming an image on a sheet and a sheet conveyance mechanism for conveying a sheet, the image forming system further including a bookbinding apparatus for forming notches on an end side of a sheet on which an image has been formed by the image forming apparatus body, for stacking a plurality of sheets on which the notches have been formed so as to form a bundle of sheets, for applying adhesive on an end portion of a side of the bundle of sheets where the notches have been formed, for bonding a cover sheet thereon, and for wrapping the bundle of sheets with the cover sheet to make a booklet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

Fig. 1 is a schematic diagram representing the overall configuration of an image forming system equipped with image forming apparatus, bookbinding apparatus and sheet ejecting apparatus.

Fig. 2 is a perspective view of the image forming system.

Fig. 3 is a sectional view of the sheet conveyance path of a bookbinding apparatus of the present invention.

Fig. 4 is a sectional view of the bookbinding apparatus showing the process of applying adhesive to a

sheet bundle.

Fig. 5 is a perspective view of a paste coating device and a holding device.

Fig. 6 is a sectional view of a cover-sheet trimming device and cover-sheet outfitting device.

Fig. 7 is a sectional view of the upper limit position of the cover-sheet outfitting device.

Fig. 8 is a perspective view of a booklet binding process.

Fig. 9 is a sectional view of a notch-forming device.

Fig. 10(a) is a plan view of a die and punch and Fig. 10(b) is a perspective views of a die and punch.

Fig. 11(a) is a perspective view wherein a plurality of notches are formed on a sheet and the notch scraps produced by notching are separated, and Fig. 11(b) is a perspective view of a sheet bundle made up of stacked sheets wherein each of the sheets has multiple notches.

Fig. 12 is a perspective view of a sheet bundle made up of stacked sheets wherein each of the sheets has multiple notches.

Fig. 13 is a perspective view of another embodiment of a sheet bundle made up of stacked sheets wherein each of the sheets has multiple notches.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0012] Next, a bookbinding apparatus of the invention and an image forming system provided with the bookbinding apparatus will be explained as follows, referring to the drawings.

[Image forming system]

[0013] Fig. 1 is an entire structure diagram of an image forming system equipped with image forming apparatus body A, bookbinding apparatus B and sheet ejection apparatus C and Fig. 2 is a perspective view of an appearance of the image forming system.

[Image forming apparatus body]

[0014] Image forming apparatus body A has an image forming unit wherein charging unit 2, image exposure unit 3, developing unit 4, transfer unit 5A, neutralizing unit 5B and cleaning unit 6 are arranged around rotary image carrier 1. In the image forming unit, exposure scanning based on image data obtained from a document through reading by a laser beam of the image exposure unit 3 is conducted after a surface of the image carrier 1 is charged evenly by the charging unit 2, to form a latent image, and the latent image is developed reversely by the developing unit 4, and a toner image is formed on a surface of the image carrier 1.

[0015] Sheet S fed from sheet storing section 7A is transported to a transfer position. In the transfer position, the toner image stated above is transferred onto sheet

S by the transfer unit 5A. After that, charges on the reverse side of the sheet S is eliminated by the neutralizing unit 5B and the sheet S is separated from the image carrier 1 to be transported by transportation section 7B, and then, is heated and fixed by fixing unit 8 to be ejected from sheet ejection roller 7C.

[0016] When forming images on both sides of sheet S, sheet S subjected to heating and fixing by fixing unit 8 is diverged from an ordinary sheet ejection path by transportation path changeover device 7D, then, is reversed upside down through a movement in a form of a switchback in reversing transportation section 7E, and passes through the image forming section again so that an image is formed on the back of sheet S, and is ejected out of the apparatus from sheet ejection roller 7C through fixing unit 8. Sheet S ejected from the sheet ejection roller 7C is fed into bookbinding apparatus B.

[0017] With respect to the surface of image carrier 1 after image processing, developing agents remaining on the surface are removed by cleaning unit 6 so that the image carrier 1 turns out to be ready for the succeeding image forming.

[Bookbinding apparatus]

[0018] Fig. 3 is a sectional view showing a sheet transportation path of bookbinding apparatus B relating to the invention.

[0019] Bookbinding apparatus B is composed of sheet introduction unit 10, sheet ejection unit 20, sheet bundle storage unit 30, sheet bundle transportation unit 40, paste coating unit 50 (refer to Fig. 4), cover-sheet supply unit 60, cover-sheet trimming device 70, cover-sheet outfitting device 80 (wrapping-bookbinding unit), alignment device 89 and booklet conveyance unit 100. The respective units are arranged nearly longitudinally and vertically in the main body of the bookbinding apparatus.

<Sheet introduction unit 10>

[0020] Sheet S that has been introduced into the sheet introduction unit 10 is interposed between inlet rollers 11 and 12 to be transported, and is diverged by transportation path changeover device 31 to either one of the sheet ejection unit 20 and the sheet bundle storage unit 30.

<Sheet ejection unit 20>

[0021] After this sheet transportation is established, the transportation path changeover device 31 closes a transportation path leading to the sheet bundle storage unit 30, and opens a transportation path leading to the sheet ejection unit 20.

[0022] Sheet S passing through a transportation path leading to the sheet ejection unit 20 is interposed between transporting rollers 21 and 22 to be transported upward, and is ejected by sheet ejection roller 23 and housed in stationary sheet ejection tray 24 located at the

uppermost portion of the apparatus. On stationary sheet ejection tray 24, sheet S ejected from image forming apparatus A is directly received, and about a maximum of 200 sheets can be stacked thereon.

<Sheet bundle storage unit 30>

[0023] Sheet S diverged to the left side in the drawing located at the downstream side in the sheet transportation direction by transportation path changeover device 31 is interposed by transporting rollers 32, 33', 34, 35 and 36 to be housed at the prescribed position of sheet bundle storage unit 30 and to be stacked thereon in succession. Thus, sheet bundle Sa formed by prescribed number of sheets S is formed. The sheet bundle storage unit 30 is provided with sheet loading table 37 that is arranged obliquely, movable sheet trailing edge positioning member 38 and sheet width aligning member 39 that aligns sheets in the sheet width direction.

<Sheet bundle transportation unit 40>

[0024] Sheet bundle Sa stacked on the sheet loading table 37 of sheet bundle storage unit 30 is transported downward obliquely by an unillustrated pushing-out device. After that, the sheet bundle Sa is held by holding unit 41 of the sheet bundle transportation unit 40, and is turned while it is held so that the surface of the sheet bundle Sa to be subjected to paste coating processing (spine portion) may face downward, to be stopped at the prescribed position.

<Paste coating unit 50>

[0025] Paste coating unit 50 (refer to Fig. 4) is composed of paste coating member (which is also called a coating roller) 51, rotating unit 52 for rotational driving of the coating roller 51, paste container 53 that contains paste, movable body 54 that is movable from the rear surface side of bookbinding apparatus B which is the initial position to the front surface side while supporting the paste container 53, and an unillustrated moving unit that reciprocates the movable body 54.

[0026] Fig. 4 is a sectional view of bookbinding apparatus B showing a process of coating paste on bundle of sheets Sa, and Fig. 5 is a perspective view of paste coating unit 50 and holding unit 41.

[0027] Movable body 54 of paste coating unit 50 is moved by an unillustrated driving unit in the direction that is in parallel with the longitudinal direction of a bottom surface of sheet bundle Sa held by holding unit 41 in the erected state.

[0028] The movable body 54 starts moving from the initial position, on the back side of bookbinding apparatus B, and is moved along guide member 55 to stop at a prescribed position on the front surface side of bookbinding apparatus B, and returns to the initial position after being driven to be reversed.

[0029] Coating roller 51 dipped in paste N contained in paste container 53 is rotated by a motor of a paste coating drive unit and rotating unit 52. Forward movement or reciprocating movement of the movable body 54 allows coating roller 51 to coat paste N in the longitudinal direction of the bottom surface of sheet bundle Sa held in the erected state.

<Cover-sheet supply unit 60>

[0030] As shown in Fig. 3, cover sheet K housed in sheet feeding tray 61 of cover-sheet supply unit 60 is separated and fed by sheet feeding unit 62, interposed by transporting rollers 63, 64 and 65, and transported to cover-sheet outfitting device 80.

<Cover-sheet trimming device 70>

[0031] Fig. 6 shows cover-sheet outfitting device 80 and cover-sheet trimming device 70

[0032] The cover-sheet trimming device 70 is integrally formed on the lateral upper portion of the illustrated cover-sheet supply device 60 and on the right of an illustrated cover-sheet outfitting device 80 to be described later. The cover-sheet trimming device 70 is used to trim the length of a cover sheet K to a predetermined value in the direction of conveyance.

[0033] The cover-sheet trimming device 70 is a roller cutter unit made of a rotary knife 71 and stationary knife 72. The rotary knife 71 rotates by sliding along the stationary knife 72, and cuts the cover sheet K in the width direction of the cover sheet. The scrap of the cover sheet K having been cut drops and is stored in the chip box 73.

[0034] The length of the cover sheet K having been trimmed corresponds to the value obtained by adding the length (thickness) of the spine portion of the bundle of sheets Sa to the length of two sheets S in the direction of conveyance. In the operation section 9 of the image forming apparatus body A, when the sheet size, the number of sheets and the thickness of the sheets have been selected or detected, the control unit sets a predetermined length of the cover sheet K having been trimmed. The length of the cover sheet K before trimming is determined in response to the maximum number of the sheets.

<Cover-sheet outfitting device 80>

[0035] The cover sheet K stored in a sheet feed tray 61 of a cover-sheet supply device 60 is separated and fed by a sheet feed device 62. Sandwiched by conveyance rollers 63, 64, and 65, the cover sheet K is led into the cover-sheet outfitting device 80, and is then conveyed in the opposite direction to enter a cover-sheet trimming device 70. The cover sheet K having been cut into a predetermined length by the cover-sheet trimming device 70 is again fed to the cover-sheet outfitting device 80.

[0036] The cover sheet K fed to the cover-sheet out-

fitting device 80 is conveyed by the conveyance rollers 65 along the guide plate 87. Passing through the position where the cover sheet K is sandwiched between a driving roller 81 and a follower roller 881, the cover sheet K further passes through the position where the cover sheet K is sandwiched between a driving conveyance roller 82 and follower roller 882.

[0037] The Motor M2A of the second driving device drives and swings a cover-sheet holding member 88A through the drive transmission system Z1 including a belt and a gear train. The motor M2B of the second driving device drives and swings a cover-sheet holding member 88B through the drive transmission system Z2 including a belt and a gear train.

[0038] The cover-sheet holding member 88A includes a follower roller 881 rotatably supported by a lever which can be swung through connection with the final gear of drive transmission system Z1.

[0039] The cover-sheet holding member 88B includes a follower roller 882 rotatably supported by a lever which can be swung through connection with the final gear of drive transmission system Z2.

[0040] When the cover sheet K moves along the guide plate 87 inside the cover-sheet outfitting device 80, the motor M2A starts to drive and swings the lever so that the follower roller 881 is pressed against the conveyance roller 81 being driven and rotated. Approximately at the same time, the motor M2B starts to drive and oscillates the lever so that the follower roller 882 is pressed against the conveyance roller 82 being driven and rotated.

[0041] The cover sheet K moving along the guide plate 87 is fed sandwiched between the conveyance roller 81 and follower roller 881 installed on the upstream side in the direction of conveyance. After that, the cover sheet K is fed sandwiched between the conveyance roller 82 and follower roller 882 installed on the downstream side in the direction of conveyance, until the cover sheet K stops at a predetermined position.

[0042] Fig. 7 is a sectional view of the upper limit position of cover-sheet outfitting device 80.

[0043] While the cover sheet K mounted on the cover-sheet outfitting device 80 is fed in the vicinity of the adhesive-coated surface by the first driving device M3 of the cover-sheet outfitting device 80, the cover-sheet holding members 88A and 88B are swung by the motors M2A and M2B of the second driving device so that the cover sheet K is pressed and held in position. This arrangement prevents the cover sheet K from moving when the cover-sheet outfitting device 80 is moving. Thus, the cover sheet K is pasted accurately onto the surface of the sheet bundle Sa coated with adhesive.

[0044] When a detector PS detects that the cover sheet K has come close to the surface of the sheet bundle Sa coated with adhesive, the motors M2A and M2B cause the cover-sheet holding members 88A and 88B to release the cover sheet K.

<Booklet binding>

[0045] Fig. 8 is a perspective view of a booklet binding process. Fig. 8(a) is a perspective view of the cover sheet K placed on the moving casing 84 of the cover-sheet outfitting device 80 and the sheet bundle Sa pasted to the center of the cover sheet K. Fig. 8(b) is a perspective view representing the process wherein the bundle of sheets Sa having been pasted is subjected to wrapping-binding by the cover sheet K folded by the first folding member 86A, second folding member 86B, and pressing member 83 for wrapping the bundle of sheets with the cover sheet K. Fig. 8(c) is a perspective view of a booklet Sb produced by wrapping-binding.

[0046] In the aforementioned figures, symbol U indicates the top side representing the upper surface of the sheet bundle Sa or booklet Sb positioned upright. Symbol L indicates the bottom side showing the lower position of the sheet bundle Sa or booklet Sb.

<Booklet ejection>

[0047] After an end of a folding process for cover sheet K, a descent of belt 85 shown in Fig. 1 makes cover-sheet outfitting device 80 to descend and to retreat, rotation of ejection belt 101 is started by unillustrated drive unit, and after sheet bundle Sb has descended, the lower end portion of it is moved toward the conveyance direction with ejection belt 101 due to the contact with the ejection belt 101. The booklet Sb is laid on turning ejection belt 101, conveyed to be ejected from the apparatus and stored in the sheet ejection apparatus C.

<Sheet ejection apparatus C>

[0048] The booklets Sb having been ejected from the ejection belt 101 are sequentially placed on the elevation type sheet ejection stand 103 of the sheet ejection apparatus C from an ejection opening 102 shown in Fig. 1. When the booklets Sb have been ejected and placed on the elevation type sheet ejection stand 103, the elevation type sheet ejection stand 103 is lowered gradually by the rotating wire 104. When the elevation type sheet ejection stand 103 has reached the bottom end, the booklet Sb is transferred to the conveyance belt 105 and is ejected out of the apparatus by the drive of the conveyance belt 105.

[0049] Fig. 9 is a sectional view of the notch-forming device 90.

[0050] The notch-forming device 90 is equipped with a die 91 which is fastened to a part of the sheet conveyance path, a punch 92 fitted to the die 91 movably in the vertical direction, a drive unit to move the punch 92 up and down and a scrap collecting box 98 to accommodate paper scrap produced by notching.

[0051] The outer periphery of the punch 92 opposite to the die 91 is fitted to the inner surface of the guide member 93 movably in the vertical direction. The driving

device to move the punch 92 in the vertical direction is equipped with a motor M4, a small gear 94 connected to the motor M4, a large gear 95 engaged with the small gear 94, an crank 96 engaged with one end of the large gears 95 and capable of being swung, and a linking member 97 for connecting the crank 96 with the top of the punch 92.

[0052] The punch 92 is driven to move in the vertical direction by the motor M4 through the small gear 94, large gear 95, crank 96 and linking member 97.

[0053] A notch V (see Fig. 11) is formed on the trailing edge of the sheet S by the lowering movement of the punch 92 and fitting with the die 91.

[0054] The notch-forming device 90 is provided midway between the conveyance rollers 32 and 33. The leading edge of the sheet S coming into the bookbinding apparatus B passes through the conveyance rollers 32, the notching position of the notch-forming device 90, and conveyance rollers 33, and stops at a predetermined position. To be more specific, after a sensor (not illustrated) arranged on the upstream side of conveyance roller 32 has detected the trailing edge of the moving sheet S, a predetermined number of pulses are counted and the motor (not illustrated) is stopped so that the movement of sheet S is suspended. At the position where the sheet has stopped, a notch V is formed on the side of the trailing edge of the sheet S

[0055] Fig. 10(a) is a plan view of the die 91 and punch 92. Fig. 10(b) is a perspective view of the die 91 and punch 92.

[0056] The die 91 includes a plurality of notched blades 91a. The punch 92 includes a plurality of projected blades 92a to be fitted to the die 91.

[0057] Fig. 11(a) is a perspective view wherein a plurality of notches are formed on a sheet of paper S and the paper scraps Sc produced by notching are separated. A plurality of notches V or cuts can be formed for each sheet having been conveyed, or for each bundle of plural sheets having been stacked.

[0058] Fig. 11(b) is a perspective view of a sheet bundle Sa made up of the stacked sheets S wherein each of the sheets S has multiple notches V. Adhesive is applied to the spine portion of the sheet bundle Sa where notches V are formed. The coated adhesive spreads over into the sides and notches V so that the cover sheet K is tightly bonded to the spine portion of the sheet bundle Sa. Using the operation panel of the image forming apparatus A, the operator can specify whether or not notches are formed on the sheets. This arrangement allows the operator to specify according to the size and number of the sheets for the booklet to be formed.

[0059] The shape of the notch V to be formed need not be V-shaped shown in the figure. An appropriate notch shape can be selected according to the type and number of the sheets, as well as the properties of the adhesive.

[0060] The notch V can be substituted by a linear cuts (slit) V'. In this case, knife-like blades may be used in-

stead of the aforementioned punch 92 movable in the vertical direction. A plate-like receiving member may be used instead of the die 91. This configuration is characterized by simple structure and absence of paper scrap Sc. However, the depth of the adhesive spreading into the cut is small.

[0061] Fig. 12 is a perspective view of a bundle of sheets Sa made up of stacked sheets S wherein each of the sheets has multiple notches V'. In the present invention, a notch includes the linear cut shown in Fig. 12. It can be defined as a shape contributing to an increase in the adhesive area of paste.

[0062] Fig. 13 is a perspective view of another embodiment of a sheet bundle Sa made up of stacked sheets S wherein each of the sheets has multiple notches V.

[0063] In Fig. 9, a well-known shifting device (not illustrated) is provided on the conveyance rollers 33 on the downstream side of the notch forming device 90 in the direction of sheet conveyance. The shifting device shifts the sheet S sandwiched between the conveyance rollers 33 by a predetermined distance in the direction across the sheet width perpendicular to the direction of sheet conveyance.

[0064] Multiple notches V are formed on the first sheet S by the notch forming device 90, and the sheet is conveyed. After that, the second sheet S is fed, and the sheet S sandwiched between the conveyance rollers 33 is shifted by a predetermined distance in the direction perpendicular to the sheet conveyance direction by the shifting device. After that, multiple notches V are formed on the second sheet S by the notch forming device 90.

[0065] Similarly, notches V are formed on multiple succeeding sheets S one after another, and these sheets are fed to the sheet-bundle storage device 30, whereby a sheet bundle Sa is formed. Thus, multiple notch grooves V between laminar sheets are diagonally provided on the spine portion of the sheet bundle Sa, as shown in the figure.

[0066] Multiple notch grooves V are arranged at an approximately equally spaced interval on the spine portion of the sheet bundle Sa, thereby forming a surface to be bonded.

[0067] The following arrangement can also be used. The bookbinding apparatus B of the present invention is built as an independent apparatus, and the sheet bundle Sa processed by another image forming apparatus is loaded on the sheet-bundle storage device 30. After that, the sheet bundle is subjected to the processes of adhesive application and bonding a cover sheet, whereby a wrapping-bound booklet is produced.

[0068] The aforementioned bookbinding apparatus can be downsized accompanied with downsizing of the notch forming mechanism. This eliminates the need of using a large-sized device such as a milling machine used in a conventional bookbinding, and reduces the apparatus installation space. Further, the aforementioned arrangement improves the binding strength and the quality of the bound booklet product since it ensures the book-

binding capability equivalent to that provided by the use of a conventional milling machine.

[0069] Further, the notch forming mechanism is provided on the sheet conveyance path upstream from the sheet storage section in the direction of sheet conveyance, and the process of notching is applied to each sheet prior to being formed into a sheet bundle. This arrangement ensures a reduced size, reduced production cost and reduced noise of the notch forming mechanism.

[0070] Further, the operator can specify whether or not notches are formed on the sheet. Proper choice can be made according to the size and number of the sheets of the bundle.

[0071] Furthermore, the notch forming mechanism is equipped with a die secured on the sheet conveyance path, a punch having projected cutter blades and performing vertical movement while fitted with the aforementioned die and a driving mechanism for the vertical punch movement. This arrangement ensures a reduced size, reduced production cost and reduced noise of the notch forming mechanism.

[0072] Still further, the image forming system including an image forming apparatus body and a bookbinding apparatus provides powerful bonding between the cover sheet and the sheet bundle made up of a plurality of sheets fed out from the image forming apparatus, and ensures automatic and continuous bookbinding operations.

Claims

1. A bookbinding apparatus for bonding a cover sheet to an end portion of a bundle of sheets and for producing a booklet by wrapping the bundle of sheets with the cover sheet, the bookbinding apparatus comprising:

a notch forming mechanism for forming notches, before each sheet is formed into the bundle of sheets, on an end side of the each sheet to be coated with adhesive.

2. The bookbinding apparatus of claim 1, wherein the notch forming mechanism is positioned in a path for conveyance of a sheet and on an upstream side, in a conveyance direction of the sheet, of a sheet bundle storing section where a plurality of sheets are stacked.
3. The bookbinding apparatus of claim 1 or 2, wherein the notch forming mechanism forms notches on one sheet at a time.
4. The bookbinding apparatus of any one of claims 1 - 3, structured such that whether notches are formed on a sheet or not, is selectable.

5. The bookbinding apparatus of any one of claims 1 - 4, wherein the notch forming mechanism comprises:

a die fixed on a sheet conveyance path;
a punch which has projected blades and is raised and lowered while fitting the die; and
a driving mechanism for raising and lowering the punch.

6. An image forming system comprising:

an image forming apparatus body including

an image forming section for forming an image on a sheet; and
a sheet conveyance mechanism for conveying a sheet, the image forming system further comprising:

a bookbinding apparatus for forming notches on an end side of a sheet on which an image has been formed by the image forming apparatus body, for stacking a plurality of sheets on which the notches have been formed so as to form a bundle of sheets, for applying adhesive on an end portion of a side of the bundle of sheets where the notches have been formed, for bonding a cover sheet thereon, and for wrapping the bundle of sheets with the cover sheet to make a booklet.

7. The image forming system of claim 6, wherein the bookbinding apparatus comprises a notch forming mechanism for forming notches on a sheet on an upstream side, in a conveyance direction of the sheet, of a sheet bundle storing section where a plurality of sheets are stacked to make a bundle of sheets.

8. The image forming system of claim 6 or 7, wherein the bookbinding apparatus comprises a notch forming mechanism which forms notches on one sheet at a time.

9. The image forming system of any one of claims 6 - 8, structured such that whether notches are formed on a sheet or not, is selectable in the bookbinding apparatus.

10. The image forming system of any one of claims 6 - 9, wherein the bookbinding apparatus comprises a notch forming mechanism for forming notches on a sheet, the notch forming mechanism including:

a die fixed on a sheet conveyance path;
a punch which has projected blades and is

raised and lowered while fitting the die; and
a driving mechanism for raising and lowering the
punch.

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FIG. 1

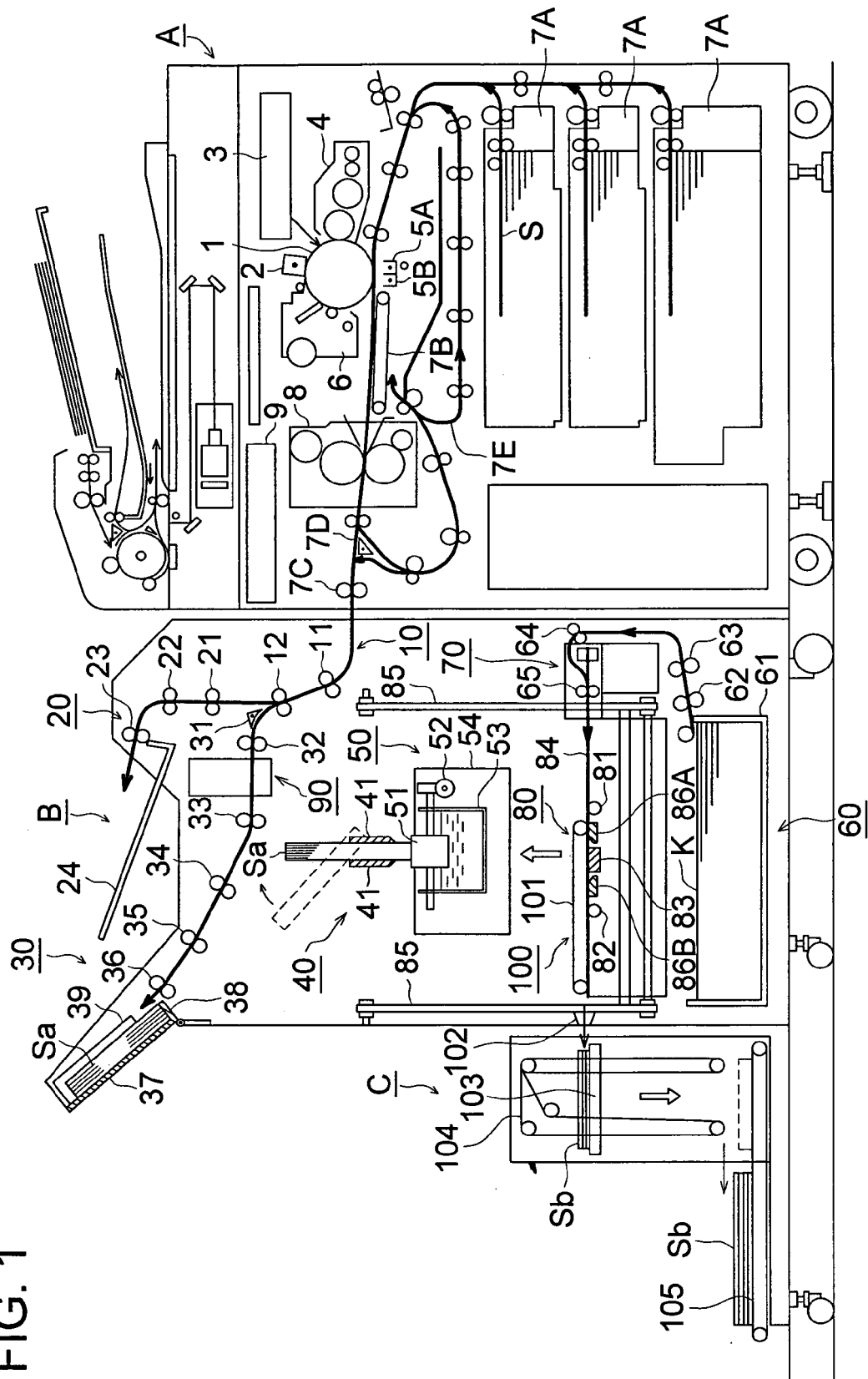


FIG. 2

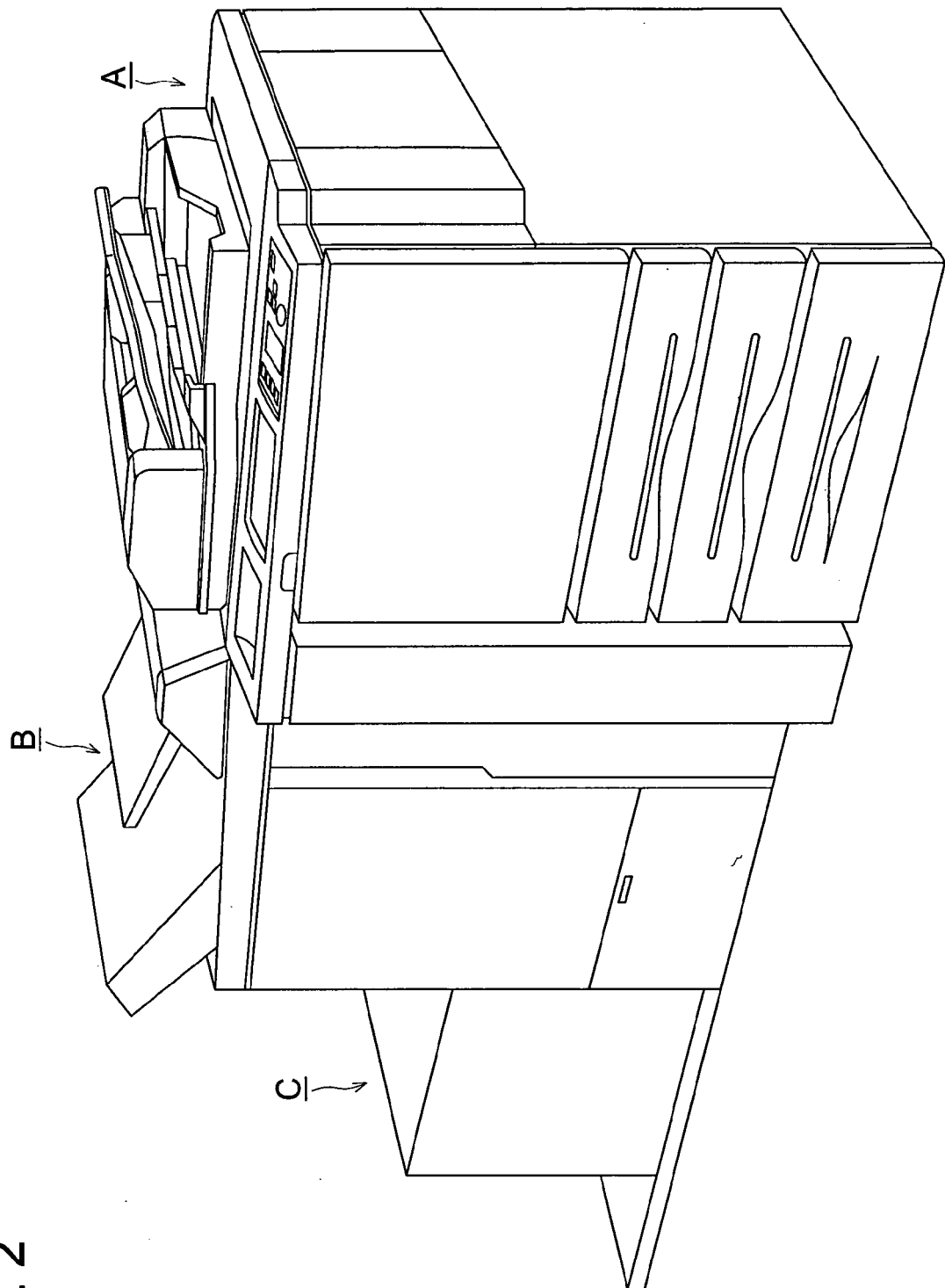


FIG. 3

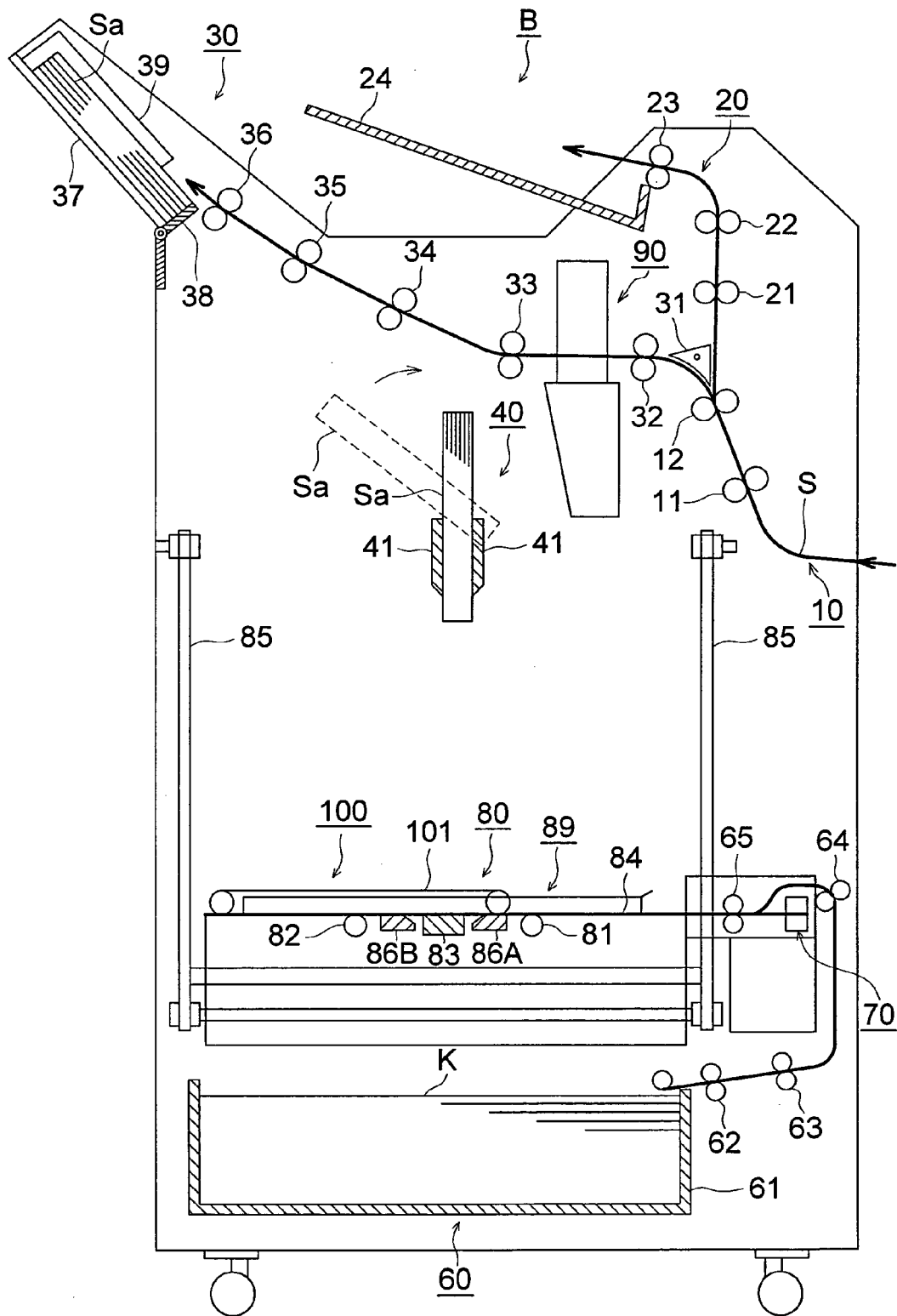


FIG. 4

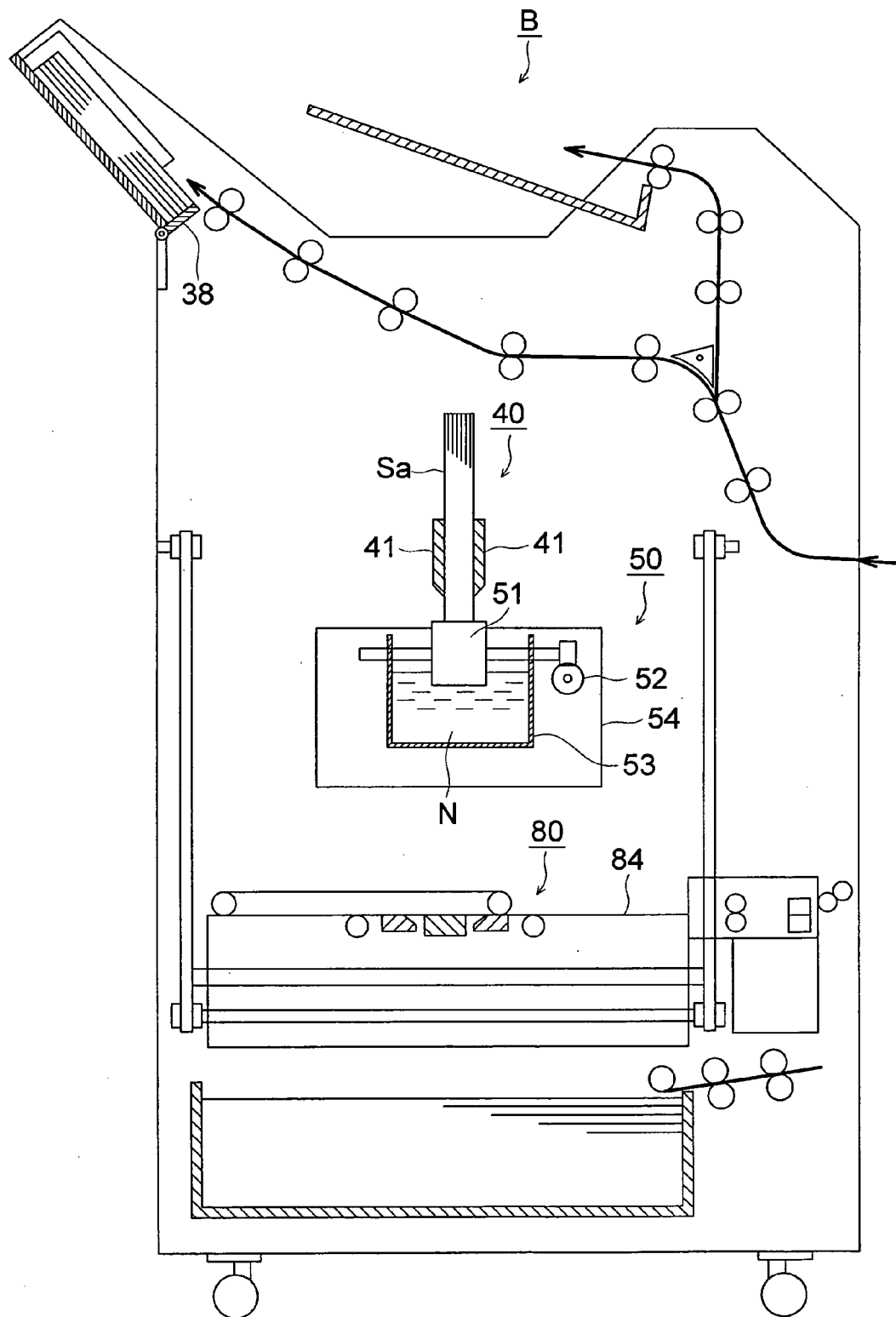


FIG. 5

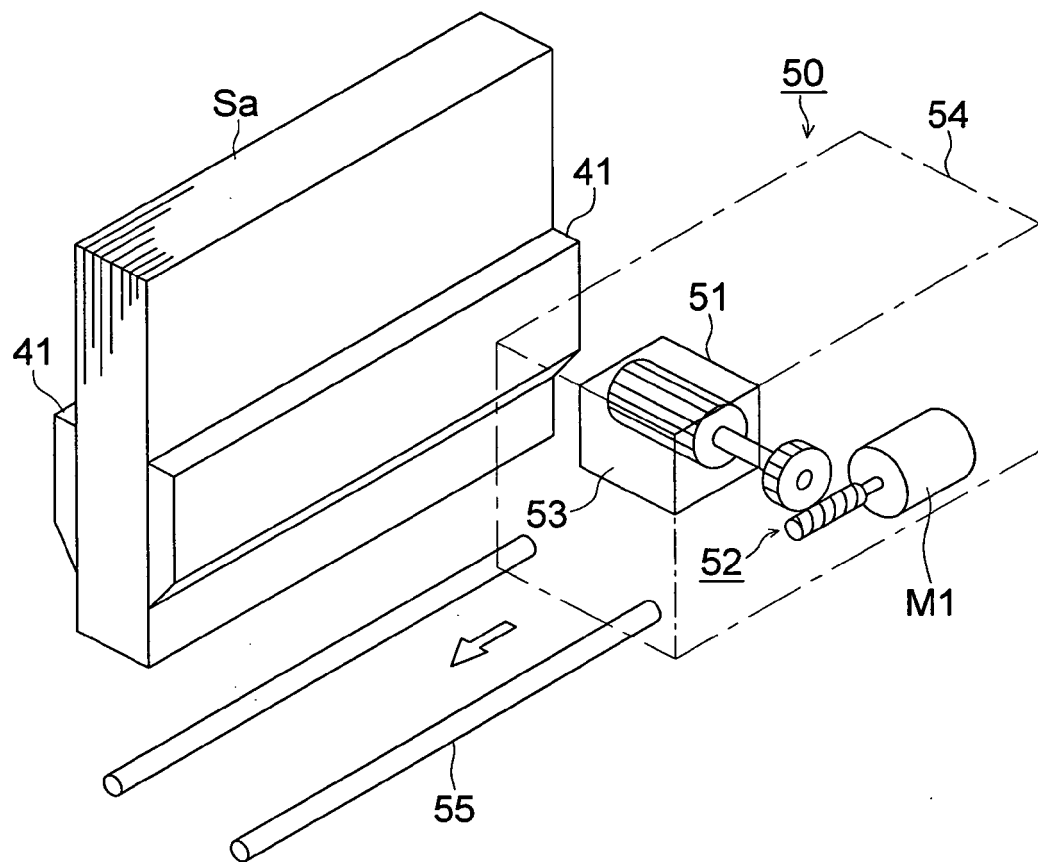


FIG. 6

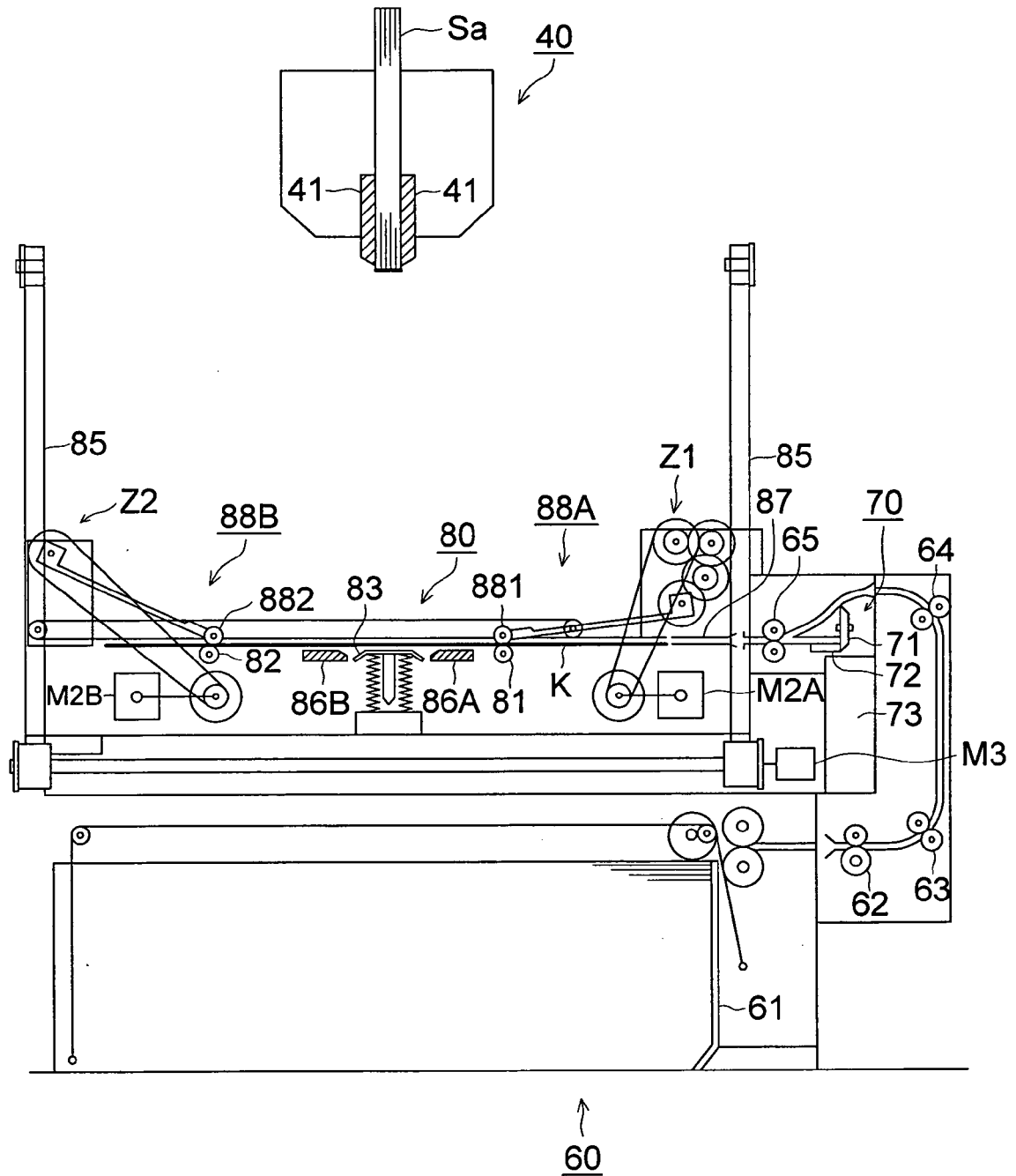


FIG. 7

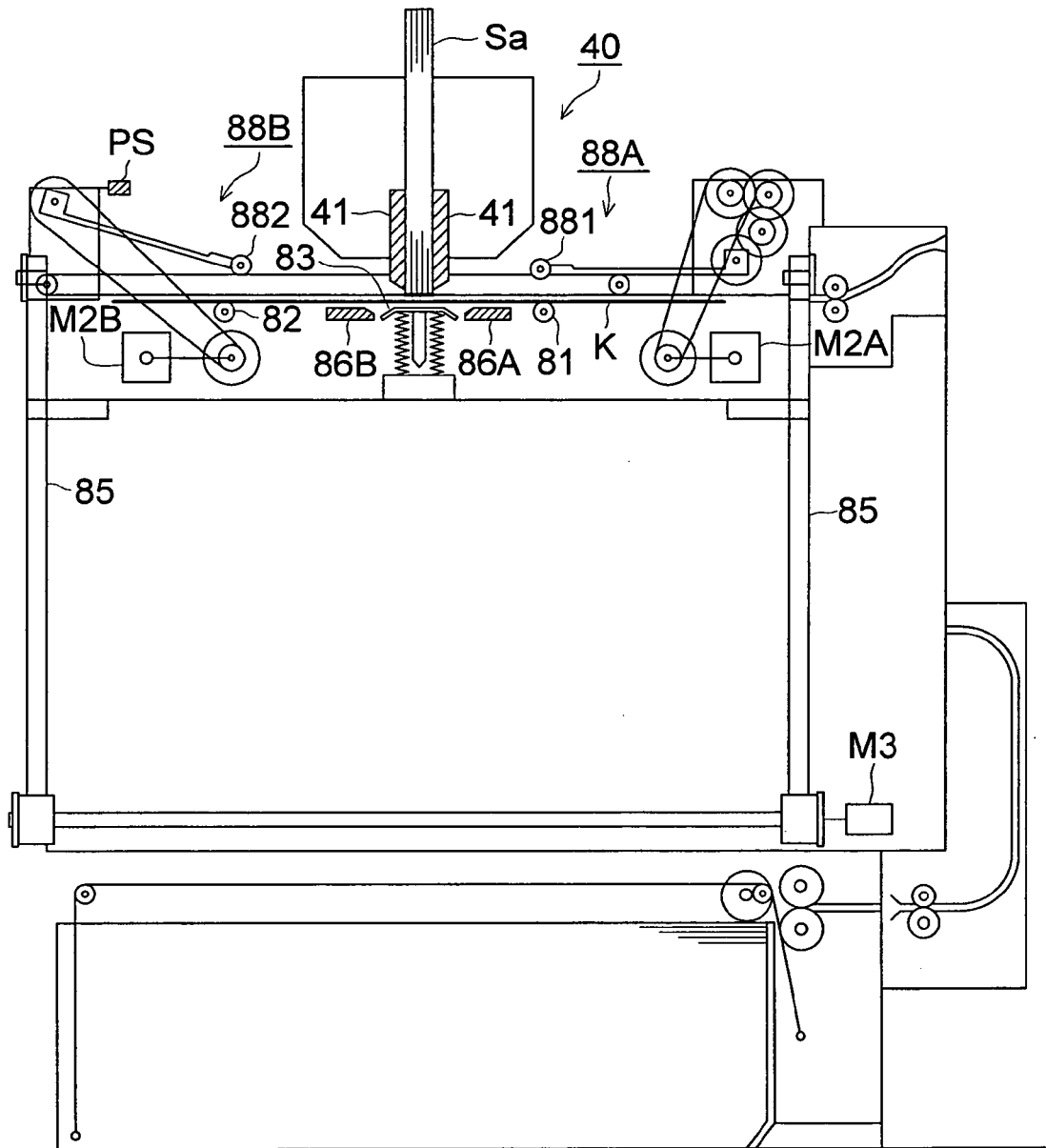


FIG. 8 (a)

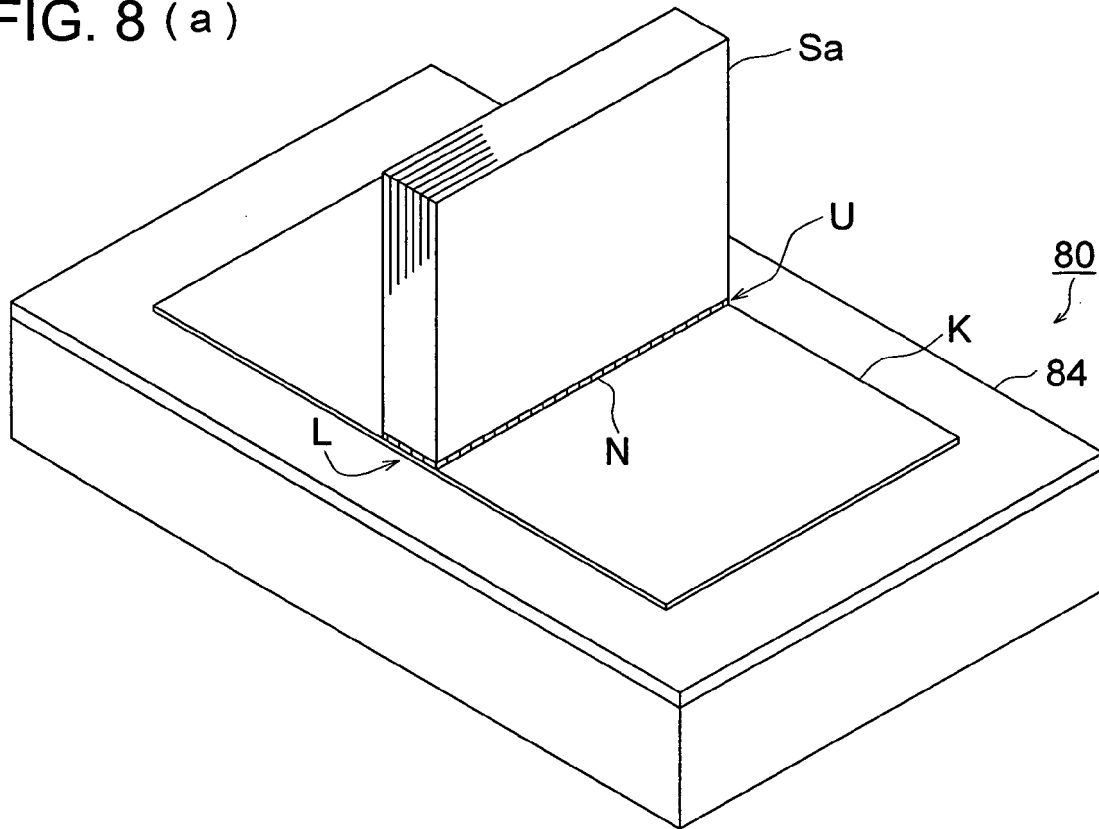


FIG. 8 (b)

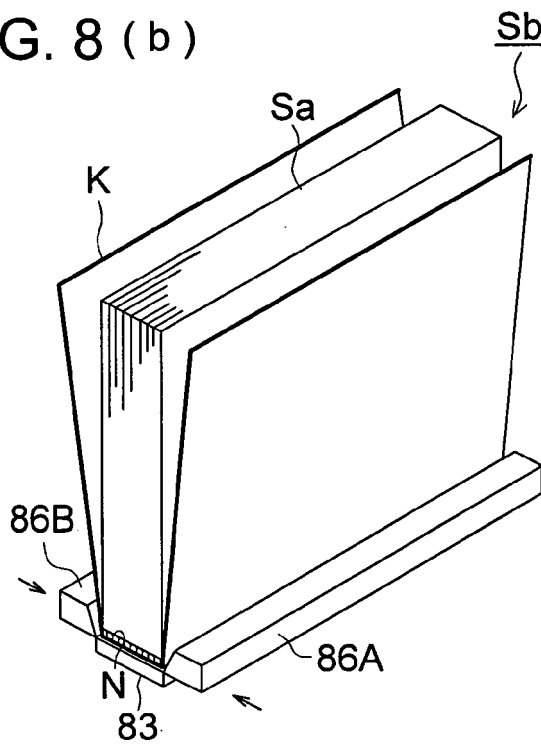


FIG. 8 (c)

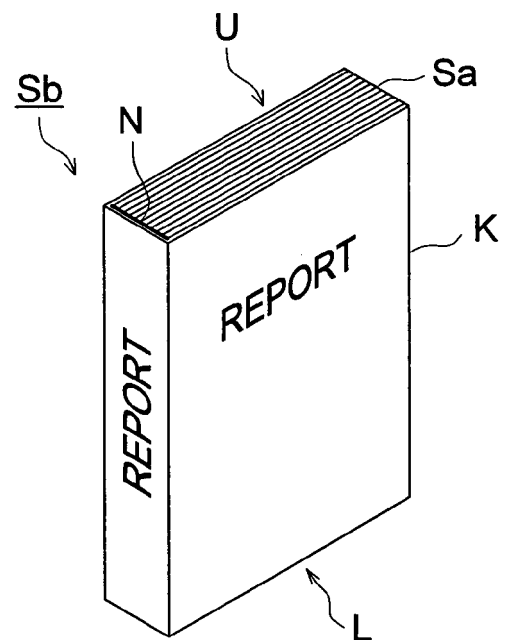


FIG. 9

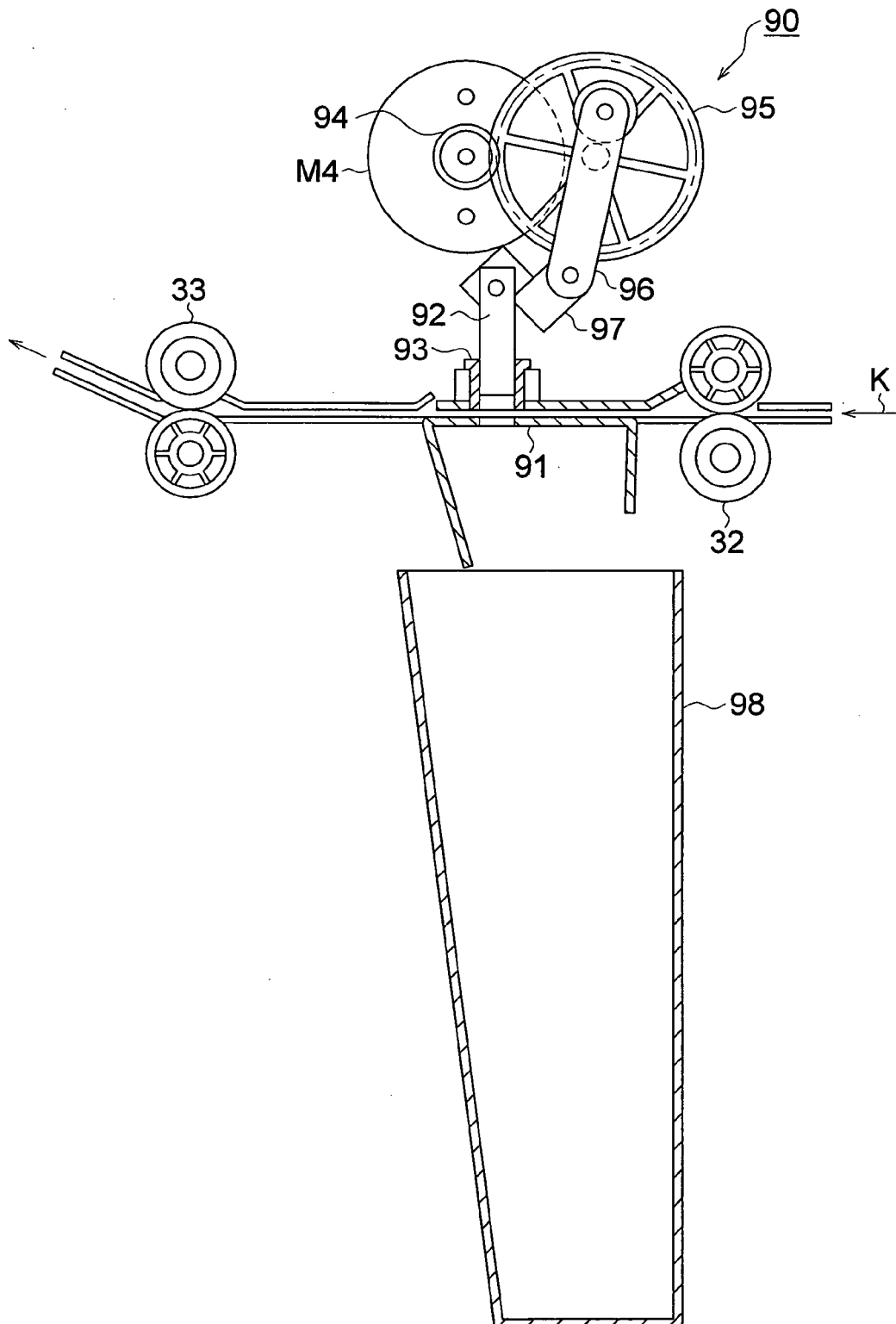


FIG. 10 (a)

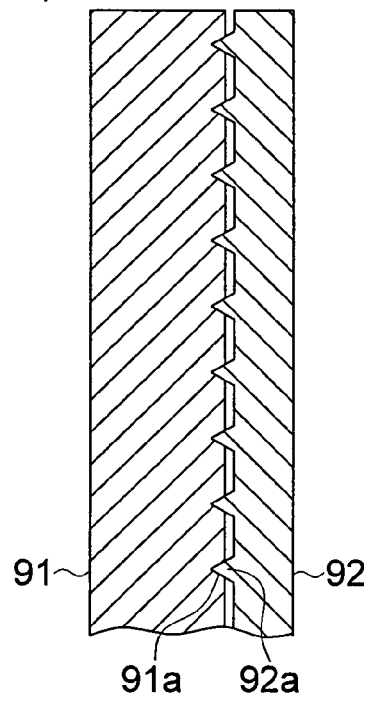


FIG. 10 (b)

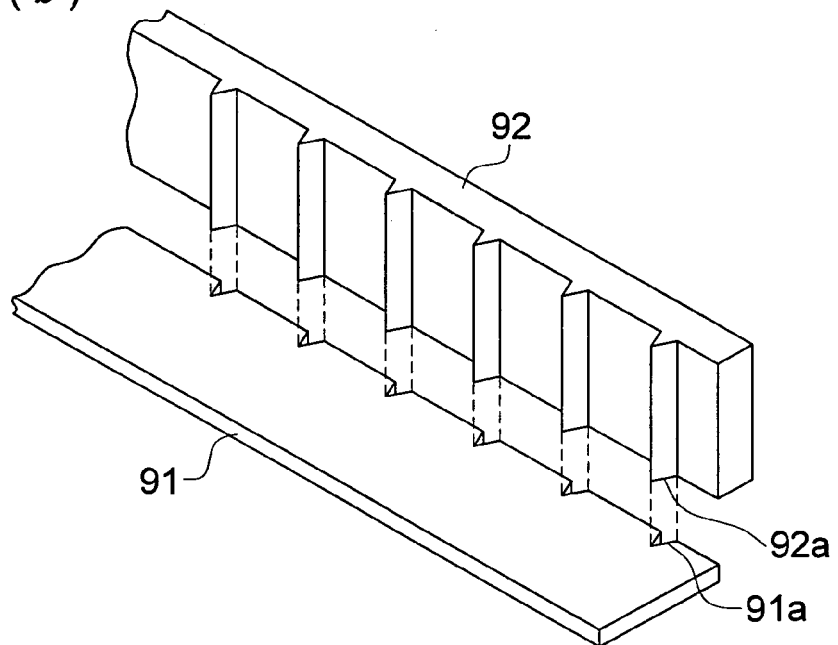


FIG. 11 (a)

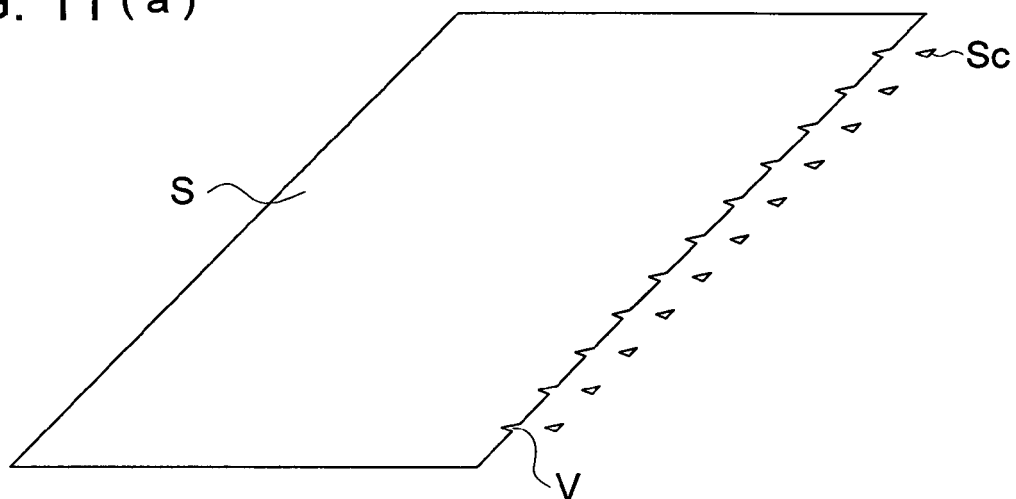


FIG. 11 (b)

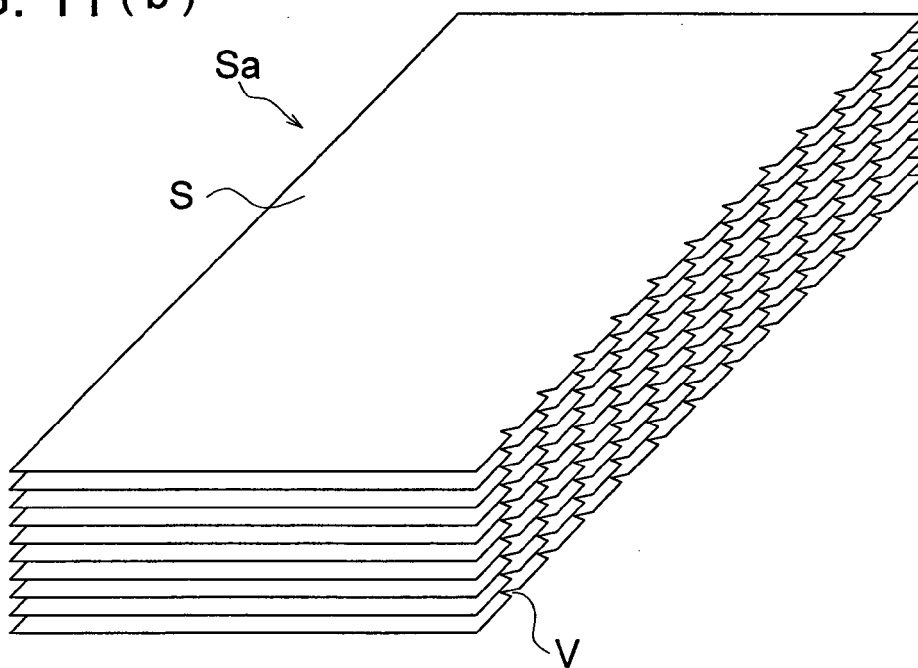


FIG. 12

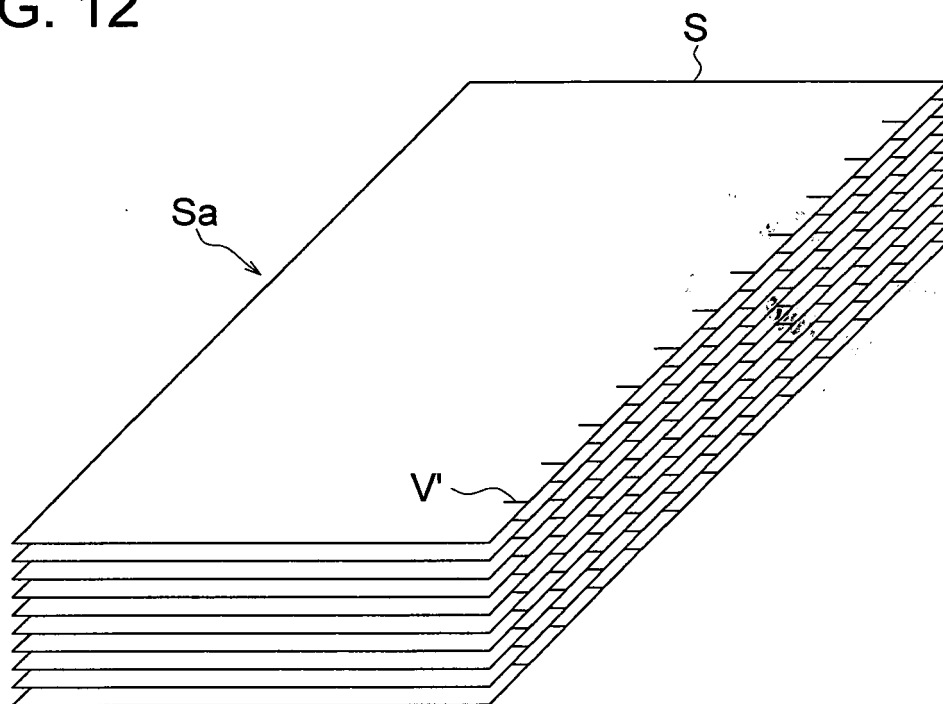
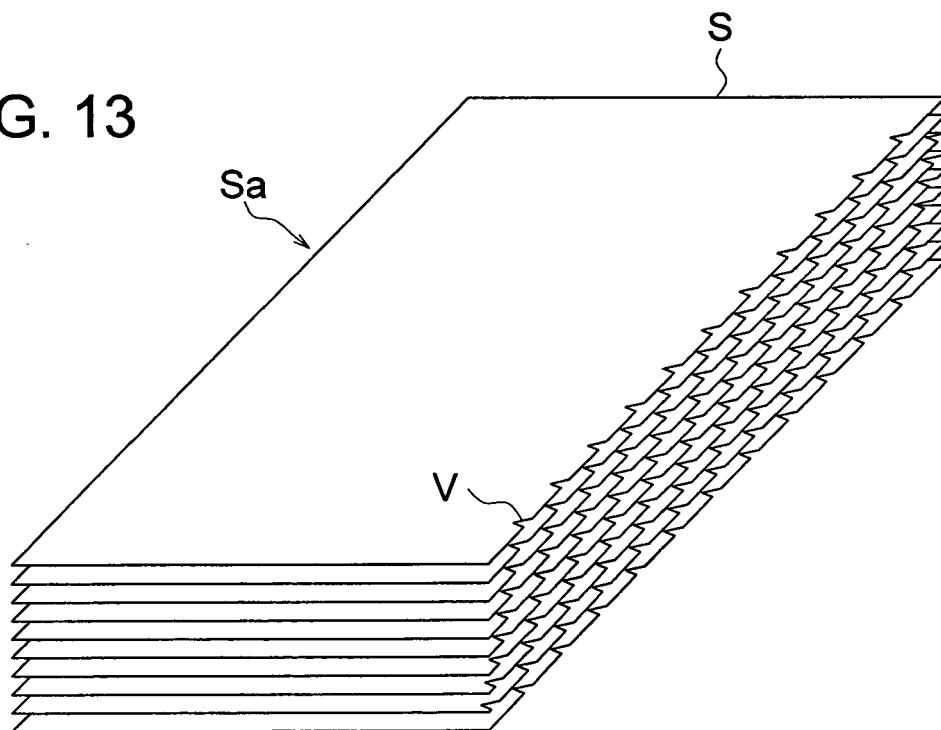


FIG. 13



REFERENCES CITED IN THE DESCRIPTION

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