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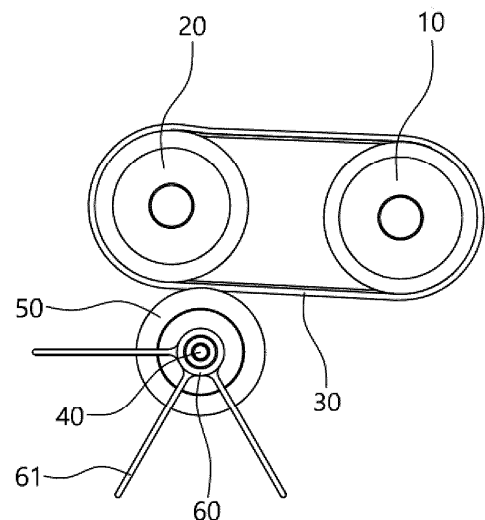
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(54) **METHOD FOR CONTROLLING MEDIA ACCEPTOR**

(57) An embodiment of a method for controlling a media acceptor includes: stopping transport of a preceding rejected medium at a time point when a trailing end portion of the preceding rejected medium is located on an upper surface of a bill press when the preceding rejected medium enters a media separator side; forming a clearance space for entry of a succeeding rejected medium at an upper side of the bill press by lowering and rotating the bill press to be inclined downward to one side in a state in which the trailing end portion of the preceding rejected medium is located on the upper surface of the bill press; blocking the succeeding rejected medium from entering a lower portion of the clearance space and simultaneously supporting the trailing end portion of the preceding rejected medium to be in close contact with the upper surface of the bill press by rotating a loop sheet to be located in the clearance space; forming a space into which a leading end portion of the succeeding rejected medium can enter by forming a predetermined gap between a drive belt provided in the media separator and the bill press when the succeeding rejected medium enters the media separator side; and rotating the loop sheet to retract to an outside of the clearance space, bringing the drive belt of the media separator and the bill press into close contact with each other, and simultaneously transporting the preceding rejected medium and the succeeding rejected medium to a media transport mechanism side

when the leading end portion of the succeeding rejected medium is stacked on the trailing end portion of the preceding rejected medium.

[FIG.1]



Description

[Technical Field]

5 **[0001]** The present disclosure relates to a method for controlling media acceptor, and more particularly, to a method for controlling media acceptor capable of stacking and returning rejected media while preventing media jams during a return process of the rejected media.

[Background Art]

10 **[0002]** Conventional automated financial machines are devices developed to rapidly and conveniently provide unmanned financial services, except for consulting tasks, regardless of time. Examples of such machines include a Cash Dispenser Unit (CDU), a Bill Recycling Machine (BRM), and a Cash and Check In Module (CCIM) capable of simultaneously depositing and rejecting a plurality of media such as cash and checks in bundle modules.

15 **[0003]** A conventional media acceptor includes a bundle module for inputting and receiving media in bundle modules, a separator for separating the media input to the bundle module sheet by sheet, and a discriminator for discriminating information and authenticity of the deposited media transported through the separator, wherein the media discriminated as accepted notes by the discriminator are transported to and stored in a cassette, and the media discriminated as rejected notes by the discriminator are transported in a direction opposite to the depositing direction, pass through the separator, are stacked, and are then returned to the bundle module.

20 **[0004]** FIG. 1 illustrates a connection structure of a drive belt, a gate roller, and a stack roller provided in a media separation part of a conventional media acceptor, and the media separator of the conventional media acceptor includes a drive belt 30 connected to the pick-up pulley 10 and the feed pulley 20 and driven to rotate in both directions to transport deposited media or rejected media, a gate roller 50 connected to a rotation shaft 40, the rotation of which is restricted from rotating in the depositing direction and allowed in the media rejecting direction, and a stack roller 60 coupled to the rotation shaft 40 at one side of the gate roller 50 to rotate integrally with the rotation shaft 40, and having a plurality of rubber sheets 61 attached thereto for guiding a trailing end portion of the rejected media returned after being discriminated as rejected notes by the discriminator to be transported toward the bundle module side.

25 **[0005]** When returning rejected media in the conventional media depositing machine, if a preceding rejected media that is returned in advance is stacked on a bill press and a part of its leading end portion is transported toward the media transport mechanism side of the bundle module, the bill press descends and tilts backward to stack the leading end portion of a succeeding returned rejected media in an overlapping state on the trailing end portion of the preceding rejected media while the three rubber sheets 61 press the trailing end portion of the preceding rejected media. At this time, a media jam occurs because the leading end portion of the succeeding rejected media is rolled downward by a triangular clearance space formed on the bill press, or the leading end portion of the succeeding rejected media is blocked and crumpled by a partial separation roller and a media transport belt provided in an overlapping state between the media separator and the media transport path.

30 **[0006]** Prior art related to the media acceptor is disclosed in Korean Patent Registration No. 10-2425145.

40 [Detailed Description of Invention]

[Technical Problem]

45 **[0007]** The present disclosure is directed to solving the above-mentioned problems, and an object of the present disclosure is to provide a method for controlling a media acceptor capable of stacking rejected media and returning them in a bundle form while preventing media jams during the return process of the rejected media.

[Technical Solution]

50 **[0008]** According to an aspect of the present disclosure, there is provided a control method of media acceptor, comprising: stopping transport of a preceding rejected medium at a time point when a trailing end portion of the preceding rejected medium is located on an upper surface of a bill press when the preceding rejected medium enters a media separator side; forming a clearance space for entry of a succeeding rejected medium at an upper side of the bill press by lowering and rotating the bill press to be inclined downward to one side in a state in which the trailing end portion of the preceding rejected medium is located on the upper surface of the bill press; blocking the succeeding rejected medium from entering a lower portion of the clearance space and simultaneously supporting the trailing end portion of the preceding rejected medium to be in close contact with the upper surface of the bill press by rotating a loop sheet to be located in the clearance space; forming a space into which a leading end portion of the succeeding

rejected medium can enter by forming a predetermined gap between a drive belt provided in the media separator and the bill press when the succeeding rejected medium enters the media separator side; and rotating the loop sheet to retract to an outside of the clearance space, bringing the drive belt of the media separator and the bill press into close contact with each other, and simultaneously transporting the preceding rejected medium and the succeeding rejected medium to a media transport mechanism side when the leading end portion of the succeeding rejected medium is stacked on the trailing end portion of the preceding rejected medium.

[0009] In the step of rotating the loop sheet to be located in the clearance space, the succeeding rejected medium is blocked from entering the lower portion of the clearance space by a loop part formed on the loop sheet, and the trailing end portion of the preceding rejected medium is supported in close contact with the upper surface of the bill press by a pressing part formed on the loop sheet.

[0010] The media separator comprises a pick-up pulley and a feed pulley provided at positions spaced apart from each other on both sides, and a drive belt traveling on the pick-up pulley and the feed pulley to transport media, and wherein the step of forming a predetermined gap between the drive belt and the bill press comprises forming a predetermined gap between the drive belt on the side where the pick-up pulley is located and the bill press by rotating the media separator upward around a rotation shaft of the feed pulley.

[0011] The step of bringing the drive belt and the bill press into close contact with each other comprises holding the preceding rejected medium and the succeeding rejected medium between the drive belt on the side where the pick-up pulley is located and the bill press by rotating the media separator downward around the rotation shaft of the feed pulley.

[0012] The media separator comprises a pick-up pulley and a feed pulley provided at positions spaced apart from each other on both sides, and a drive belt traveling on the pick-up pulley and the feed pulley to transport media, and wherein the step of forming a predetermined gap between the drive belt and the bill press comprises forming a predetermined gap between the drive belt on the side where the pick-up pulley is located and the bill press by moving the bill press downward.

[0013] A medium detector for sensing a position to which the rejected medium has moved is provided on one side of the media separator, and wherein when entry of the preceding rejected medium is sensed by the medium detector, transport of the preceding rejected medium is stopped at a time point when the trailing end portion of the preceding rejected medium is located on the upper surface of the bill press.

[0014] When the trailing end portion of the preceding rejected medium is located on the upper surface of the bill press, the bill press descends and rotates to be inclined downward to one side.

[0015] When the bill press descends and rotates to be inclined downward to one side, the loop sheet is rotated to be located in the clearance space to block the succeeding rejected medium from entering a lower portion of the clearance space on the bill press, and simultaneously, the trailing end portion of the preceding rejected medium is pressed against and supported on the upper surface of the bill press.

[0016] The media separator comprises a pick-up pulley and a feed pulley provided at positions spaced apart from each other on both sides, and a drive belt traveling on the pick-up pulley and the feed pulley to transport media, and wherein when entry of the succeeding rejected medium is sensed by the medium detector, the loop sheet rotates to an outside of the clearance space, and simultaneously, the media separator rotates upward around a rotation shaft of the feed pulley to form a predetermined gap between the drive belt on the side where the pick-up pulley is located and the bill press.

[0017] When the leading end portion of the succeeding rejected medium is stacked on the trailing end portion of the preceding rejected medium, the media separator rotates downward around the rotation shaft of the feed pulley to simultaneously transport the preceding rejected medium and the succeeding rejected medium held between the drive belt on the side where the pick-up pulley is located and the bill press to the media transport mechanism side.

[Advantageous Effects]

[0018] According to the control method of the media acceptor of the present disclosure, it is possible to prevent a problem in which the leading end portion of the succeeding rejected media rolls downward and causes a jam by supporting the succeeding rejected media entering the triangular clearance space formed on the inclined bill press by the loop sheet during the return process of the rejected media.

[0019] In addition, by ensuring a predetermined gap between the drive belt and the bill press at the time when the succeeding rejected media enters the media separator, the succeeding rejected media can pass through the space between the drive belt and the bill press and be smoothly transported without causing a jam.

[Description of Drawings]

[0020]

FIG. 1 is a view illustrating a connection structure of a drive belt, a gate roller, and a stack roller provided in a media separator of a conventional media acceptor.

FIG. 2 is a view illustrating a media transport mechanism and a media separator provided in a media acceptor according to the present disclosure.

FIG. 3 is a perspective view illustrating a state in which a gate roller and a loop sheet are coupled to a rotation shaft in the media acceptor according to the present disclosure.

FIG. 4 is a view illustrating a state in which a rejected medium enters the media separator, a trailing end portion of the rejected medium is supported on an upper surface of a bill press, and the bill press is lowered from a separation position to a middle position in the media acceptor according to the present disclosure.

FIG. 5 is a view illustrating a state in which the bill press further descends from the middle position to a reject position, tilts to one side, and rotates downward, so that the trailing end portion of the rejected medium supported on the upper surface of the bill press tilts to one side, thereby providing a triangular clearance space at an upper side thereof.

FIG. 6 is a view illustrating a state in which the drive belt rotates upward with respect to the rotation shaft of the feed pulley so that the pick-up pulley side moves upward, the succeeding rejected medium enters toward the media separator, a loop part of the loop sheet is located at a lower portion of the triangular clearance space, and simultaneously, the trailing end portion of the preceding rejected medium is pressed and supported on the upper surface of the bill press by a pressing part of the loop sheet.

FIG. 7 is a view illustrating a state in which the loop sheet is located by retracting to the inside of a transport guide, and the drive belt rotates downward with respect to the rotation shaft of the feed pulley so that the drive belt on the pick-up pulley side rotates while holding the trailing end portion of the preceding rejected medium and the leading end portion of the succeeding rejected medium to return them as rejected.

FIG. 8 is a view illustrating a state in which the loop part of the loop sheet is located at the lower portion of the triangular clearance space in a state where the trailing end portion of the succeeding rejected medium is supported on the upper surface of the bill press, and simultaneously, the trailing end portion of the succeeding rejected medium is pressed and supported on the upper surface of the bill press by the pressing part of the loop sheet, and another succeeding rejected medium enters toward the media separator.

FIG. 9 is a view illustrating a state in which rejected media are transported to and stacked in a media stacking space of the media transport mechanism and then returned as rejected in bundle modules, and the bill press is moved upward to an initial separation position.

FIG. 10 is a view illustrating a state in which the preceding rejected medium is transported to the transport path of the media transport mechanism, and another succeeding rejected medium enters the media separator side in a state where the trailing end portion of the succeeding rejected medium is supported on the upper surface of the bill press by the loop sheet.

FIG. 11 is a view illustrating a state in which the second media transport mechanism moves upward after all rejected media are stacked on the transport path of the media transport mechanism, the stacked bundle of rejected media is reject-transported, and the bill press moves upward to the original separation position by the driving of an elevating mechanism.

** Description of Reference Numerals **

[0021]

10 :	pick-up pulley	20 :	feed pulley
30 :	drive belt	40 :	rotation shaft
50 :	gate roller	60 :	stack roller
61 :	rubber sheet	1 :	media acceptor
100 :	media transport mechanism	110 :	first media transport mechanism
111, 112 :	first pulley	113 :	First transport belt
114, 115 :	first tension roller	116 :	link member
120 :	second media transport mechanism	121, 122 :	second pulley
123 :	second transport belt	124 :	support roller
125, 126 :	second tension roller	200 :	media separator
210 :	pick-up pulley	211 :	rotary shaft of pick-up pulley
220 :	feed pulley	221 :	rotary shaft of feed pulley
230 :	drive belt	240 :	gate roller

(continued)

241 :	rotation shaft	250,250-1,250-2 :	loop sheet
251 :	loop portion	252 :	pressing portion
260 :	coupling part	300 :	bill press
301 :	bill press hinge shaft	310 :	bottom portion of bill press
400 :	transport guide	500 :	elevating mechanism
510 :	support frame	520 :	drive shaft
530 :	first link	540 :	link pivot shaft
550 :	first guide shaft	551 :	first guide member
552 :	first guide slot	560 :	second guide shaft
561 :	second guide member	562 :	second guide slot
570 :	second link	580 :	connecting shaft
590 :	support	600 :	medium detector
M :	medium	M1 :	preceding rejected medium
M 1' :	trailing end portion of the preceding rejected medium		
M 2 :	succeeding rejected medium		
M 2' :	leading end portion of the succeeding rejected medium		
M 3 :	another succeeding rejected medium		
S :	clearance space		

[Modes of the Invention]

[0022] Hereinafter, the configuration and operation of preferred embodiments of the present disclosure will be described in detail with reference to the accompanying drawings. In the following description, the 'leading end portion' of the medium refers to the leading end portion based on the forward moving direction of the medium, and the 'trailing end portion' of the medium refers to the trailing end portion based on the forward moving direction of the medium.

[0023] Referring to FIG. 2, a media acceptor 1 to which the present disclosure is applied includes a media transport mechanism 100 for transporting media stacked in a bundle form, a media separator 200 for separating the bundle of media transported along the media transport mechanism 100 sheet by sheet when depositing media, and for reject-transporting a preceding rejected medium M1 and a succeeding rejected medium M2 in a partially overlapping state when returning rejected media, and a bill press 300 provided to be movable up and down below the media separator 200 to provide a transport surface for the deposited media or the rejected media.

[0024] The media acceptor 1 is provided with a discriminator (not shown) for discriminating information and authenticity of the deposited media. The media discriminated as accepted notes by the discriminator are transported in a depositing direction (left direction based on FIG. 2) and processed for depositing, and the rejected media discriminated as unaccepted notes are reject-transported in a withdrawal direction (right direction based on FIG. 2) and returned.

[0025] A transport guide 400 forming a transport surface for deposited media or rejected media is provided on one side of the bill press 300, an elevating mechanism 500 for driving upward and downward movements of the bill press 300 is provided below the bill press 300, and a medium detector 600 for sensing whether the rejected media enters the media separator 200 side is provided on one side of the media separator 200.

[0026] The media transport mechanism 100 includes a first media transport mechanism 110 provided at an upper portion of the bundle media to contact an upper surface of the input bundle media, and a second media transport mechanism 120 provided at a lower portion of the bundle media to contact a lower surface of the input bundle media.

[0027] The first media transport mechanism 110 may include a pair of first pulleys 111 and 112 provided at positions spaced apart from each other on both sides, a first transport belt 113 traveling on the pair of first pulleys 111 and 112 and holding the upper surface of the bundle media, a plurality of first tension rollers 114 and 115 applying tension to the first transport belt 113 in a downward direction toward the bundle media, and a link member 116 connecting the plurality of first tension rollers 114 and 115.

[0028] The first media transport mechanism 110 can be driven to rotate in both directions, and can be driven in a depositing direction rotating clockwise based on FIG. 2 and a withdrawal direction (rejecting direction) rotating counterclockwise based on FIG. 2.

[0029] The second media transport mechanism 120 may include a pair of second pulleys 121 and 122 provided at

positions spaced apart from each other on both sides, a second transport belt 123 traveling on the pair of second pulleys 121 and 122 and holding the lower surface of the bundle media, a support roller 124 supporting the second transport belt 123, and a plurality of second tension rollers 125 and 126 applying tension in an upward direction toward the bundle media.

[0030] The second media transport mechanism 120 can be driven to rotate in both directions, and can be driven in a depositing direction rotating counterclockwise based on FIG. 2 and a rejecting direction rotating clockwise based on FIG. 2.

[0031] The second media transport mechanism 120 can move up and down in response to a thickness change according to the number of input bundle media. That is, the bundle media is transported along a media transport path 101 provided between the first transport belt 113 and the second transport belt 123, and since stable transport is possible only when the upper and lower surfaces of the bundle media are held by the first transport belt 113 and the second transport belt 123, respectively, the height of the media transport path 101 is configured to be adjustable in response to the thickness change of the bundle media according to the amount of upward and downward movement of the second media transport mechanism 120.

[0032] The transport path 101 is a space where rejected media are reject-transported and stacked.

[0033] The media separator 200 includes a pick-up pulley 210 and a feed pulley 220 provided at positions spaced apart from each other on both sides, a drive belt 230 traveling on the pick-up pulley 210 and the feed pulley 220 and transporting media by separating them sheet by sheet, and a gate roller 240 provided below the feed pulley 220 to be in contact with the drive belt 230, the gate roller 240 not rotating in the depositing direction but being capable of rotating in the opposite direction to apply frictional force so that the media can be separated into single sheets.

[0034] The feed pulley 220 is provided to rotate in place around a feed pulley rotation shaft 221.

[0035] The pick-up pulley 210 rotates around a pick-up pulley rotation shaft 211, is provided to be capable of moving up and down within a predetermined clearance range around the feed pulley rotation shaft 221, and is supported by an elastic member (not shown) so that it can apply a separation pressure by being pressed downward.

[0036] The bill press 300 is provided to move up and down while supporting a set number of media. That is, a stacking space capable of stacking 3 to 5 partially separated media is provided between the bill press 300 and the drive belt 230 of the media separator 200.

[0037] During media depositing, when in a standby state before media is transported, the bill press 300 is in a lowered position, and during a partial separation operation and a single-sheet separation operation of the media, the bill press 300 moves upward to a set height. As the bill press 300 moves up and down, the pick-up pulley 210 and the drive belt 230 coupled thereto provided on an upper side thereof are lifted upward or moved downward by the bill press 300.

[0038] When the bill press 300 moves upward to move the pick-up pulley 210 upward, the pick-up pulley 210 is located on the same height line as the feed pulley 220. At this time, the drive belt 230 is positioned horizontally, so that the lower surface of the drive belt 230 can entirely hold the upper surface of the partially separated media.

[0039] When the bill press 300 moves downward, the pick-up pulley 210 moves downward by an elastic member (not shown) to be located at a lower height than the feed pulley 220.

[0040] At this time, based on FIG. 2, the drive belt 230 is inclined at a predetermined angle in a rear-downward direction, and when the drive belt 230 is rotationally driven in this state, it is possible to pick up and separate one sheet of media located at the uppermost end among the partially separated media stacked on the upper surface of the bill press 300 sheet by sheet.

[0041] On the other hand, when returning rejected media, the bill press 300 moves downward and is inclined to one side as illustrated in FIGS. 6 and 7, so that a clearance space S in which the leading end portion M2' of the succeeding rejected medium M2 can be stacked on the trailing end portion M1' of the preceding rejected medium M1 is formed as illustrated in FIG. 8.

[0042] At this time, the media separator 200 is provided with a loop sheet 250 for blocking the succeeding rejected medium M2 from rolling into the lower side of the clearance space S and simultaneously supporting the trailing end portion M1' of the preceding rejected medium M1 to be in close contact with the upper surface of the bill press 300.

[0043] Referring to FIGS. 3 to 5, the loop sheet 250 may include a loop part 251 for blocking the succeeding rejected medium M2 from entering the lower portion of the clearance space S, and a pressing part 252 for supporting the trailing end portion M1' of the preceding rejected medium M1 in close contact with the upper surface of the bill press 300.

[0044] The loop sheet 250 may be coupled to the rotation shaft 241 of the gate roller 240 on both sides of the gate roller 240. That is, a pair of loop sheets 250-1 and 250-2 may be coupled to positions spaced apart on both sides of the gate roller 240.

[0045] The loop sheet 250 is composed of two films, one film of the two films forms the loop part 251, and the other film forms the pressing part 252.

[0046] A first loop fixing part 253 and a second loop fixing part 254 are formed at both side ends of the loop part 251,

and the pressing part 252 is formed in a flat plate shape connected to one side of the first loop fixing part 253. The loop part 251 is rolled into a loop shape to be formed by overlapping and coupling the first loop fixing part 253 and the second loop fixing part 254.

[0047] A first through hole 253a is formed in the first loop fixing part 253, and a second through hole 254a is formed in the second loop fixing part 254 at a position corresponding to the first through hole 253a. The first loop fixing part 253 and the second loop fixing part 254 are coupled by a coupling pin 261a inserted into the first through hole 253a and the second through hole 254a.

[0048] The loop sheet 250 rotates around the rotation shaft 241, and a coupling part 260 for fixing the loop sheet 250 to the rotation shaft 241 is formed on the rotation shaft 241.

[0049] The coupling part 260 includes a first coupling segment 261 coupled to an outer circumferential surface of the rotation shaft 241 and having the coupling pin 261a formed thereon, and a second coupling segment 262 coupled with the first coupling segment 261 with the first loop fixing part 253 and the second loop fixing part 254 into which the coupling pin 261a is inserted interposed therebetween. The first coupling segment 261 and the second coupling segment 262 may be formed of a plurality of component segments assembled around the rotation shaft 241.

[0050] A hook part 262b may be formed on any one of the first coupling segment 261 and the second coupling segment 262, and a hook engagement portion 261b caught by the hook part 262b may be formed on the other one. The two films may be made of a polyimide material. By constructing the loop sheet 250 with a polyimide film to increase tension as described above, it is possible to prevent bending of the film compared to a conventional rubber sheet, thereby supporting the media more stably.

[0051] The elevating mechanism 500 is a component connected to the lower portion of the bill press 300 to move the bill press 300 up and down, and a first link 530 and a second link 270 are connected in a foldable linkage configuration around a link pivot shaft 540.

[0052] A driving shaft 520 rotated by a driving motor (not shown) is connected to a lower end of one side of the first link 530, and a first guide shaft 550 is connected to an upper end of the other side of the first link 530.

[0053] A second guide shaft 560 is connected to a lower end of the other side of the second link 570, and a connection shaft 580 is connected to an upper end of one side of the second link 570.

[0054] The link pivot shaft 530 is connected to an intermediate portion of the first link 530 and an intermediate portion of the second link 570.

[0055] The driving shaft 520 connected to the lower end of one side of the first link 530 is supported rotatably in place by a support frame 510, and the first guide shaft 550 connected to the upper end of the other side of the first link 530 is inserted into a first guide slot 552 formed in a lateral long hole shape in a first guide member 551 fixed to the bill press 300 to be movable in left and right directions.

[0056] The second guide shaft 560 connected to the lower end of the other side of the second link 570 is inserted into a second guide slot 562 formed in a lateral long hole shape in a second guide member 561 fixed to the support frame 510 to be movable in the left and right directions.

[0057] The connection shaft 580 connected to the upper end of one side of the second link 570 is connected to a body of the bill press 300, and the upper surface portion of the bill press 300 and the body are connected by a bill press hinge shaft 301.

[0058] In addition, a support block 590 is provided below the bottom part 310 of the bill press 300 so as to come into contact with the bottom surface of the bill press 300 when the bill press 300 descends, thereby guiding the bill press 300 to move downward and be positioned inclined to one side.

[0059] The bill press 300 can be elevated and rotationally moved to a separation position (FIG. 2) where it is located at the uppermost side and contacts the drive belt 230, a middle position (FIG. 6) where the bottom part 310 of the bill press 300 and the support block 590 come into contact, and a reject position (FIG. 7) where it further descends from the middle position to be inclined to one side so that a triangular clearance space S is provided at an upper side thereof.

[0060] The upper end of the support block 590 is provided at an eccentric position toward one side of the connection shaft 580 and the bill press hinge shaft 301. Thus, if the bill press 300 further descends from the time point when the bottom part 310 of the bill press 300 contacts the support block 590 while descending, the upper surface portion of the bill press 300 rotates to be inclined downward toward the side where the connection shaft 580 and the bill press hinge shaft 301 are located while its intermediate portion is supported by the support block 590.

[0061] On the other hand, during the return process of rejected media, when the trailing end portion M1' of the preceding rejected medium M1 is transported to be located on the upper surface of the bill press 300, the loop sheet 250 moves downward and rotates to be located in the clearance space S, blocks the succeeding rejected media M2 from entering the lower portion of the clearance space S, and simultaneously supports the trailing end portion M1' of the preceding rejected medium M1 in close contact with the upper surface of the bill press 300.

[0062] When the succeeding rejected medium M2 enters the media separator 200, the loop sheet 250 is rotated to be located outside the clearance space S.

[0063] When the succeeding rejected medium M2 enters the media separator 200 side in a state where the trailing end portion M1' of the preceding rejected medium M1 is located on the upper surface of the bill press 300, the media separator 200 rotates upward around the rotation shaft 221 of the feed pulley 220 to form a predetermined gap between the drive belt 230 on the side where the pick-up pulley 210 is located and the bill press 300, thereby forming a space into which the leading end portion M2' of the succeeding rejected medium M2 can enter.

[0064] When the leading end portion M2' of the succeeding rejected medium M2 is stacked on the trailing end portion M1' of the preceding rejected medium M1, the media separator 200 rotates downward around the rotation shaft 221 of the feed pulley 220 to simultaneously transport the preceding rejected medium M1 and the succeeding rejected medium M2 held between the drive belt 230 on the side where the pick-up pulley 210 is located and the bill press 300 to the media transport mechanism 100 side.

[0065] A medium detector 600 for sensing a position to which the rejected media has moved is provided on one side of the media separator 200, and a controller for controlling driving of the media separator 200, the bill press 300, and the loop sheet 250 based on the transport position of the rejected media sensed by the medium detector 600 is included.

[0066] Hereinafter, a process in which rejected media is reject-transported according to the method for controlling a media acceptor 1 of the present disclosure will be described.

[0067] The method for controlling a media acceptor 1 of the present disclosure includes: stopping transport of a preceding rejected medium M1 at a time point when a trailing end portion M1' of the preceding rejected medium M1 is located on an upper surface of a bill press 300 when the preceding rejected medium M1 enters a media separator 200 side; forming a clearance space S for entry of a succeeding rejected medium M2 at an upper side of the bill press 300 by lowering and rotating the bill press 300 to be inclined downward to one side in a state in which the trailing end portion M1' of the preceding rejected medium M1 is located on the upper surface of the bill press 300; blocking the succeeding rejected medium M2 from entering a lower portion of the clearance space S and simultaneously supporting the trailing end portion M1' of the preceding rejected medium M1 to be in close contact with the upper surface of the bill press 300 by rotating a loop sheet 250 to be located in the clearance space S; forming a space into which a leading end portion M2' of the succeeding rejected medium M2 can enter by forming a predetermined gap between a drive belt 230 provided in the media separator 200 and the bill press 300 when the succeeding rejected medium M2 enters the media separator 200 side; and rotating the loop sheet 250 to retract to an outside of the clearance space S, bringing the drive belt 230 of the media separator 200 and the bill press 300 into close contact with each other, and simultaneously transporting the preceding rejected medium M1 and the succeeding rejected medium M2 to a media transport mechanism 100 side when the leading end portion M2' of the succeeding rejected medium M2 is stacked on the trailing end portion M1' of the preceding rejected medium M1.

[0068] As illustrated in FIG. 2, when the entry of the preceding rejected medium M1 is sensed by the medium detector 600, the transport of the preceding rejected medium M1 is stopped at a time point when the trailing end portion M1' of the preceding rejected medium M1 is located on the upper surface of the bill press 300.

[0069] When the trailing end portion M1' of the preceding rejected medium M1 is located on the upper surface of the bill press 300, the bill press 300 descends and rotates downward to be inclined to one side as illustrated in FIGS. 6 and 7.

[0070] When the bill press 300 descends and rotates downward to be inclined to one side, as illustrated in FIG. 8, the loop sheet 250 is rotated to be located in the clearance space S to block the succeeding rejected medium M2 from entering the lower portion of the clearance space S on the bill press 300, and simultaneously, the trailing end portion M1' of the preceding rejected medium M1 is pressed against and supported on the upper surface of the bill press 300.

[0071] As illustrated in FIGS. 8 and 9, when the entry of the succeeding rejected medium M2 is sensed by the medium detector 600, the loop sheet 250 is controlled to rotate to the outside of the clearance space S, and simultaneously, the media separator 200 rotates upward around the rotation shaft 221 of the feed pulley 220 so that a predetermined gap is formed between the drive belt 230 on the side where the pick-up pulley 210 is located and the bill press 300.

[0072] In another embodiment, the step of forming a predetermined gap between the drive belt 230 and the bill press 300 may form a predetermined gap between the drive belt 230 on the side where the pick-up pulley 210 is located and the bill press 300 by moving the bill press 300 downward.

[0073] As illustrated in FIG. 9, when the leading end portion M2' of the succeeding rejected medium M2 is stacked on the trailing end portion M1' of the preceding rejected medium M1, the media separator 200 rotates downward around the rotation shaft 221 of the feed pulley 220 to simultaneously transport the preceding rejected medium M1 and the succeeding rejected medium M2 held between the drive belt 230 on the side where the pick-up pulley 210 is located and the bill press 300 to the media transport mechanism 100 side.

[0074] FIG. 10 illustrates a state in which the preceding rejected medium M1 is transported to the transport path 101 of the media transport mechanism 100, and another succeeding rejected medium M3 enters the media separator 200 side in a state where the trailing end portion M2" of the succeeding rejected medium M2 is supported on the upper

surface of the bill press 300 by the loop sheet 250. Subsequent processes repeat the processes of FIGS. 7 to 9.

[0075] FIG. 11 illustrates a state in which the second media transport mechanism 120 moves upward after all rejected media are stacked on the transport path 101 of the media transport mechanism 100, the stacked bundle of rejected media M is reject-transported, and the bill press 300 moves upward to the original separation position by the driving of the elevating mechanism 500.

[0076] As described above, according to the method for controlling a media acceptor 1 of the present disclosure, it is possible to prevent a problem in which the leading end portion M2' of the succeeding rejected medium M2 rolls downward and causes a jam by supporting the succeeding rejected medium M2 entering the triangular clearance space S formed on the inclined bill press 300 by the loop sheet 250 during the return process of rejected media.

[0077] In addition, by ensuring a predetermined gap between the drive belt 230 and the bill press 300 at the time when the succeeding rejected medium M2 enters the media separator 200, the succeeding rejected medium M2 can pass through the space between the drive belt 230 and the bill press 300 and be smoothly transported without causing a jam.

[0078] Although preferred embodiments of the present disclosure have been described in detail above, the present disclosure is not limited to the above-described embodiments, and various modifications and implementations are possible within the scope of the claims, the detailed description of the invention, and the accompanying drawings, and these also belongs to the present disclosure.

Claims

1. A method for controlling media acceptor, comprising:

stopping transport of a preceding rejected medium at a time point when a trailing end portion of the preceding rejected medium is located on an upper surface of a bill press when the preceding rejected medium enters a media separator side;

forming a clearance space for entry of a succeeding rejected medium at an upper side of the bill press by lowering and rotating the bill press to be inclined downward to one side in a state in which the trailing end portion of the preceding rejected medium is located on the upper surface of the bill press;

blocking the succeeding rejected medium from entering a lower portion of the clearance space and simultaneously supporting the trailing end portion of the preceding rejected medium to be in close contact with the upper surface of the bill press by rotating a loop sheet to be located in the clearance space;

forming a space into which a leading end portion of the succeeding rejected medium can enter by forming a predetermined gap between a drive belt provided in the media separator and the bill press when the succeeding rejected medium enters the media separator side; and

rotating the loop sheet to retract to an outside of the clearance space, bringing the drive belt of the media separator and the bill press into close contact with each other, and simultaneously transporting the preceding rejected medium and the succeeding rejected medium to a media transport mechanism side when the leading end portion of the succeeding rejected medium is stacked on the trailing end portion of the preceding rejected medium.

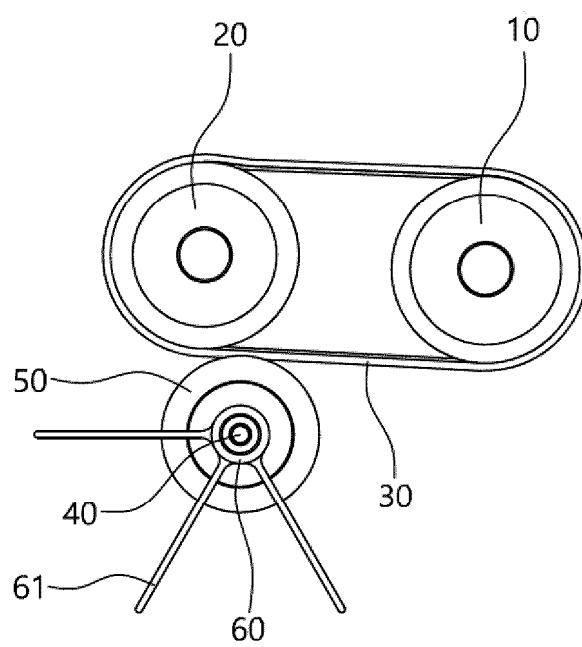
2. The method for controlling media acceptor of claim 1, wherein in the step of rotating the loop sheet to be located in the clearance space, the succeeding rejected medium is blocked from entering the lower portion of the clearance space by a loop part formed on the loop sheet, and the trailing end portion of the preceding rejected medium is supported in close contact with the upper surface of the bill press by a pressing part formed on the loop sheet.

3. The method for controlling media acceptor of claim 1, wherein the media separator comprises a pick-up pulley and a feed pulley provided at positions spaced apart from each other on both sides, and a drive belt traveling on the pick-up pulley and the feed pulley to transport media, and wherein the step of forming a predetermined gap between the drive belt and the bill press comprises forming a predetermined gap between the drive belt on the side where the pick-up pulley is located and the bill press by rotating the media separator upward around a rotation shaft of the feed pulley.

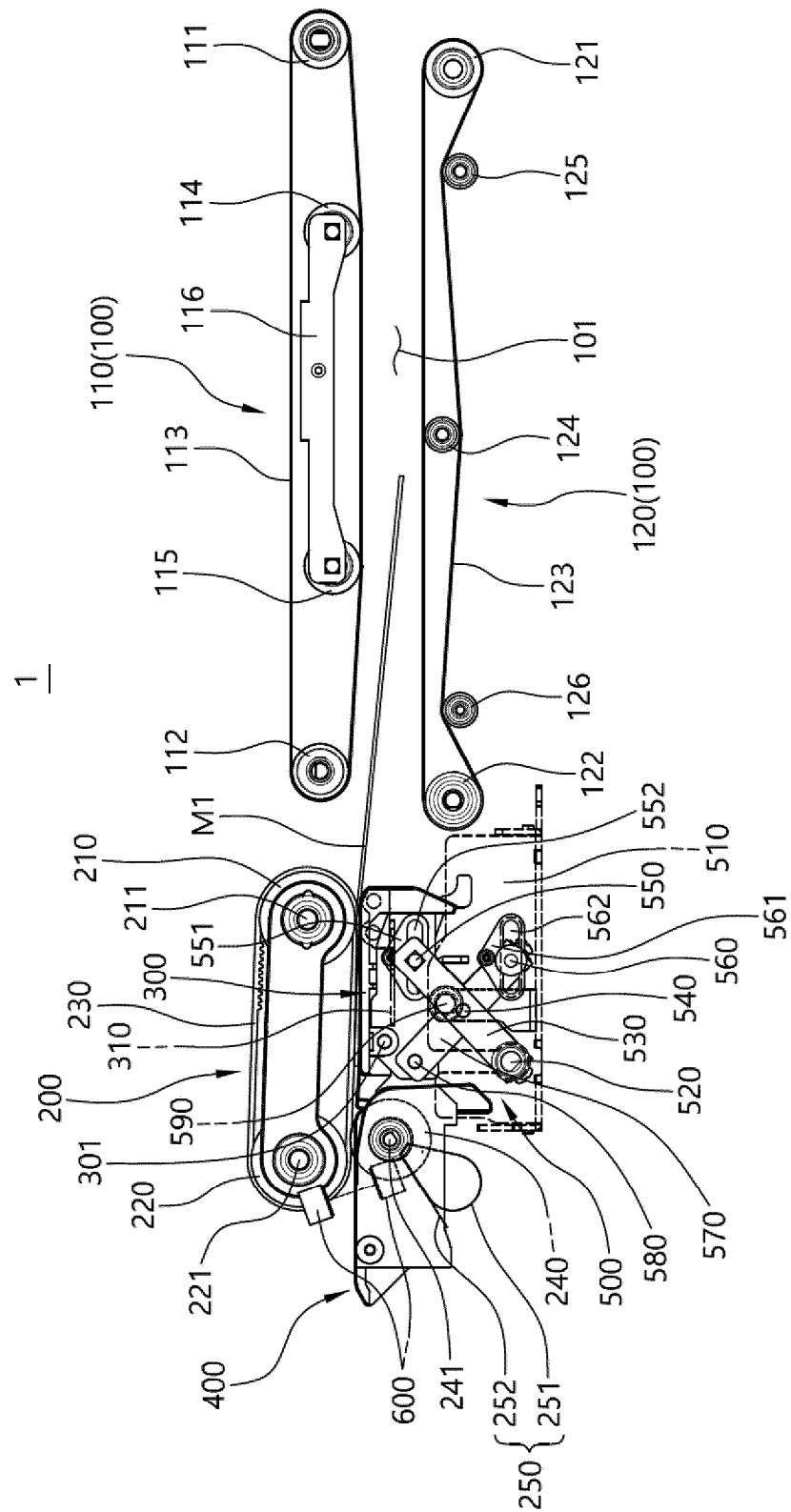
4. The method for controlling media acceptor of claim 3, wherein the step of bringing the drive belt and the bill press into close contact with each other comprises holding the preceding rejected medium and the succeeding rejected medium between the drive belt on the side where the pick-up pulley is located and the bill press by rotating the media separator downward around the rotation shaft of the feed pulley.

5. The method for controlling media acceptor of claim 1, wherein the media separator comprises a pick-up pulley and a feed pulley provided at positions spaced apart from each other on both sides, and a drive belt traveling on the pick-up pulley and the feed pulley to transport media, and
5 wherein the step of forming a predetermined gap between the drive belt and the bill press comprises forming a predetermined gap between the drive belt on the side where the pick-up pulley is located and the bill press by moving the bill press downward.
6. The method for controlling media acceptor of claim 1, wherein a medium detector for sensing a position to which the rejected medium has moved is provided on one side of the media separator, and
10 wherein when entry of the preceding rejected medium is sensed by the medium detector, transport of the preceding rejected medium is stopped at a time point when the trailing end portion of the preceding rejected medium is located on the upper surface of the bill press.
7. The method for controlling media acceptor of claim 6, wherein when the trailing end portion of the preceding rejected medium is located on the upper surface of the bill press, the bill press descends and rotates to be inclined
15 downward to one side.
8. The method for controlling media acceptor of claim 7, wherein when the bill press descends and rotates to be inclined downward to one side, the loop sheet is rotated to be located in the clearance space to block the
20 succeeding rejected medium from entering a lower portion of the clearance space on the bill press, and simultaneously, the trailing end portion of the preceding rejected medium is pressed against and supported on the upper surface of the bill press.
9. The method for controlling media acceptor of claim 8, wherein the media separator comprises a pick-up pulley and a feed pulley provided at positions spaced apart from each other on both sides, and a drive belt traveling on the
25 pick-up pulley and the feed pulley to transport media, and wherein when entry of the succeeding rejected medium is sensed by the medium detector, the loop sheet rotates to an outside of the clearance space, and simultaneously, the media separator rotates upward around a rotation shaft of the feed pulley to form a predetermined gap between the drive belt on the side where the pick-up pulley is
30 located and the bill press.
10. The method for controlling media acceptor of claim 9, wherein when the leading end portion of the succeeding rejected medium is stacked on the trailing end portion of the preceding rejected medium, the media separator
35 rotates downward around the rotation shaft of the feed pulley to simultaneously transport the preceding rejected medium and the succeeding rejected medium held between the drive belt on the side where the pick-up pulley is located and the bill press to the media transport mechanism side.

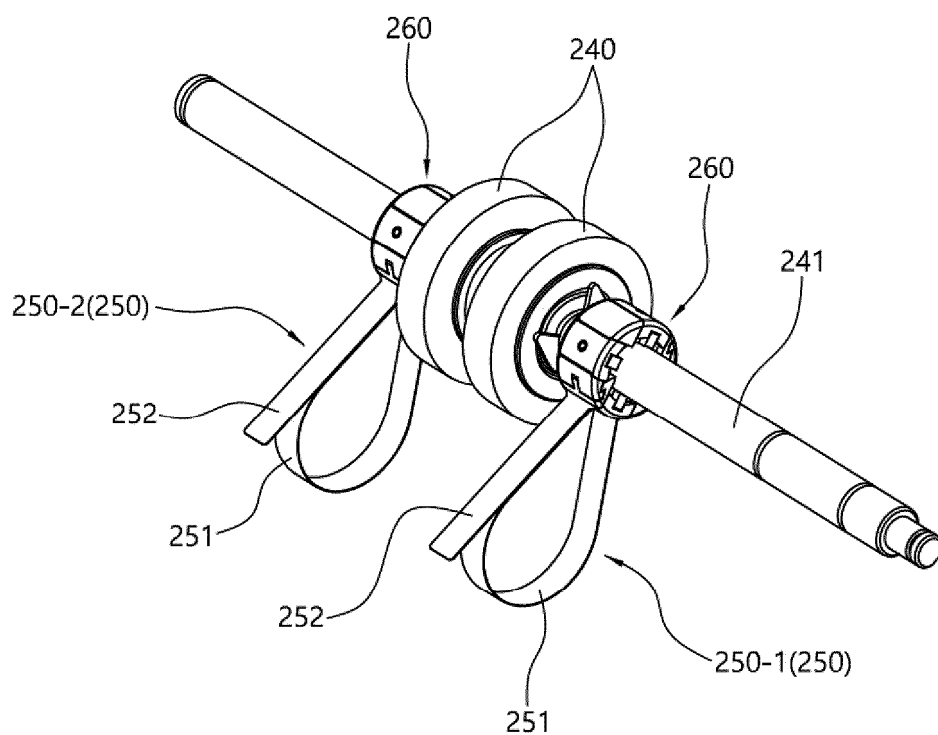
[FIG.1]



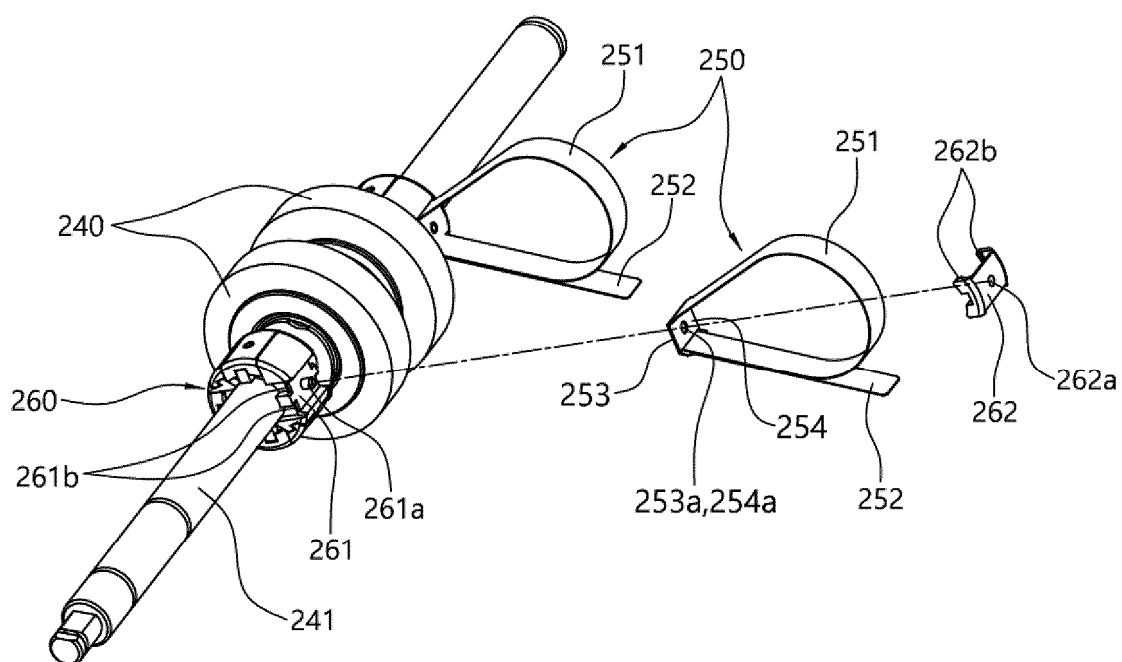
[FIG.2]



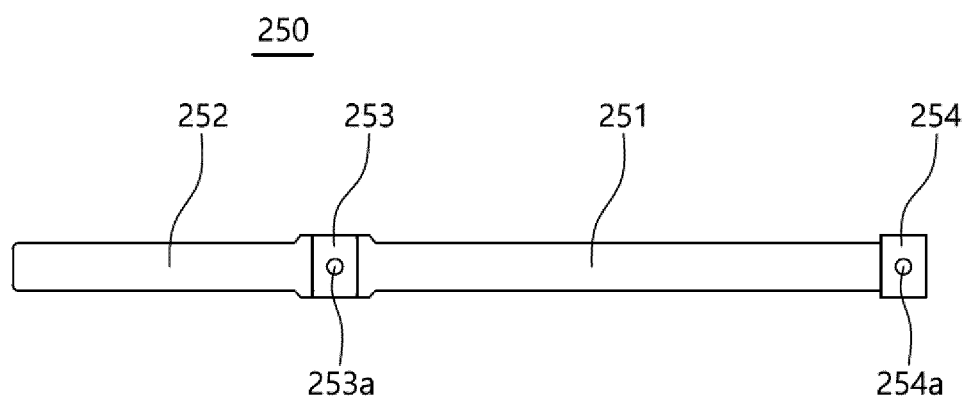
[FIG.3]



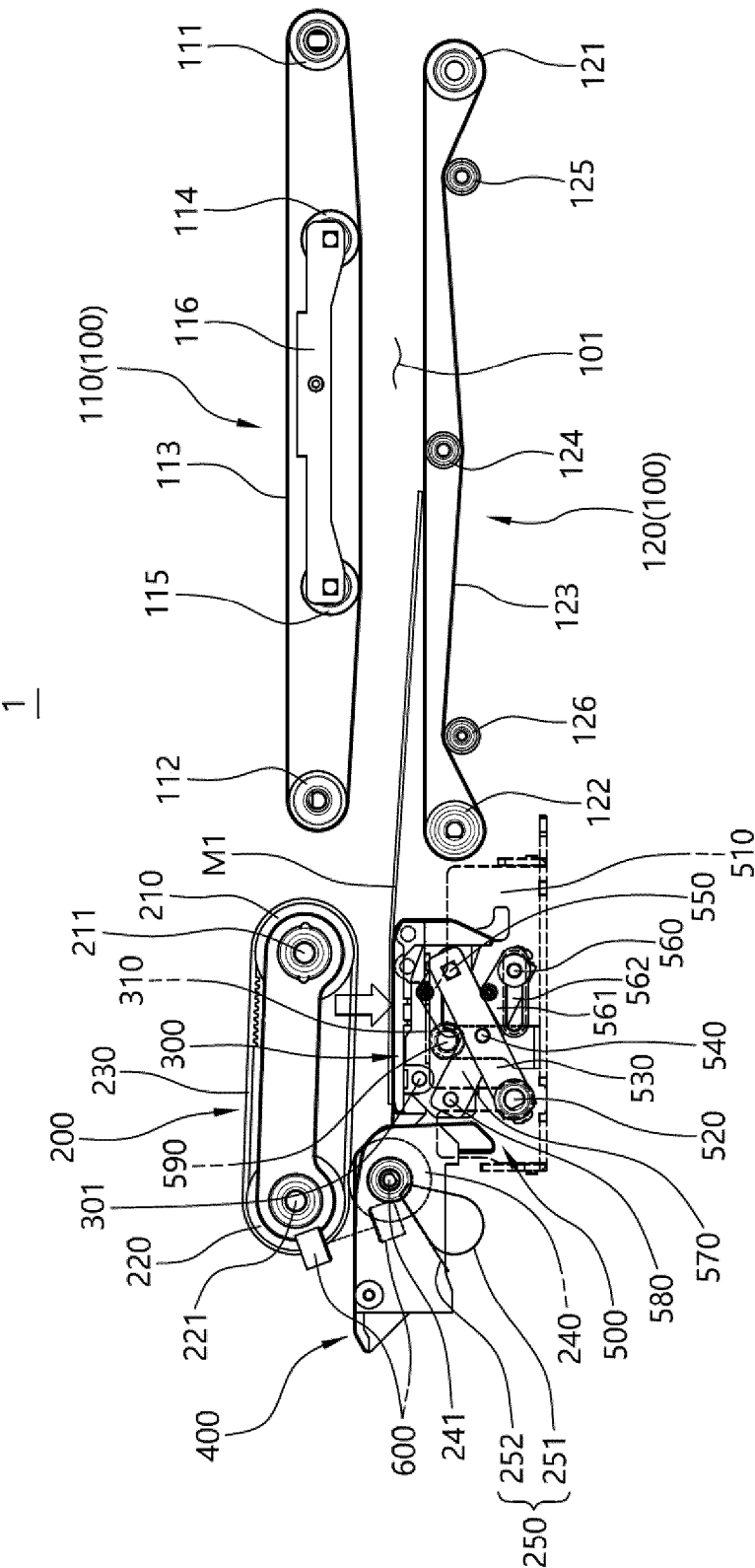
[FIG.4]



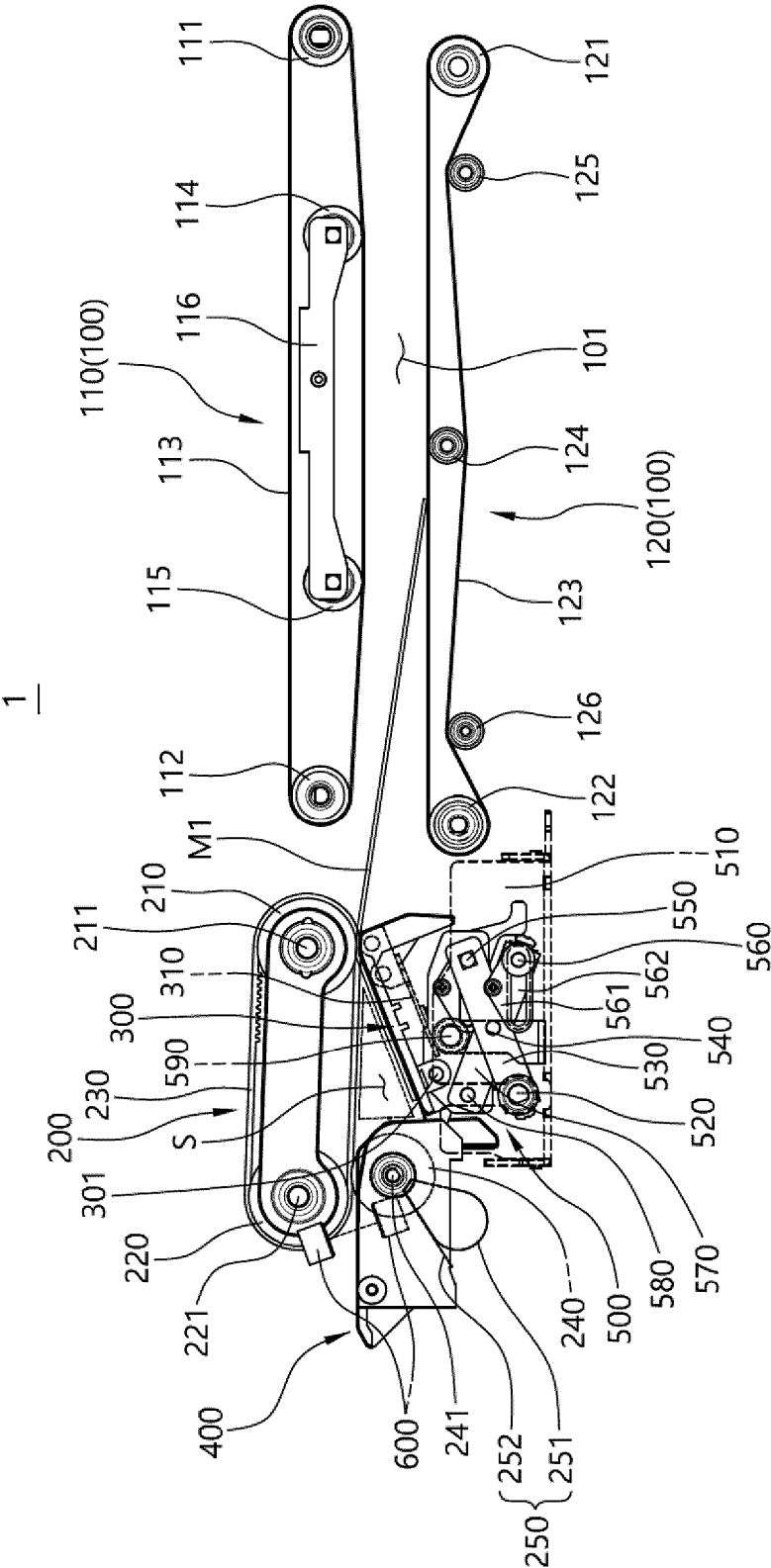
[FIG.5]



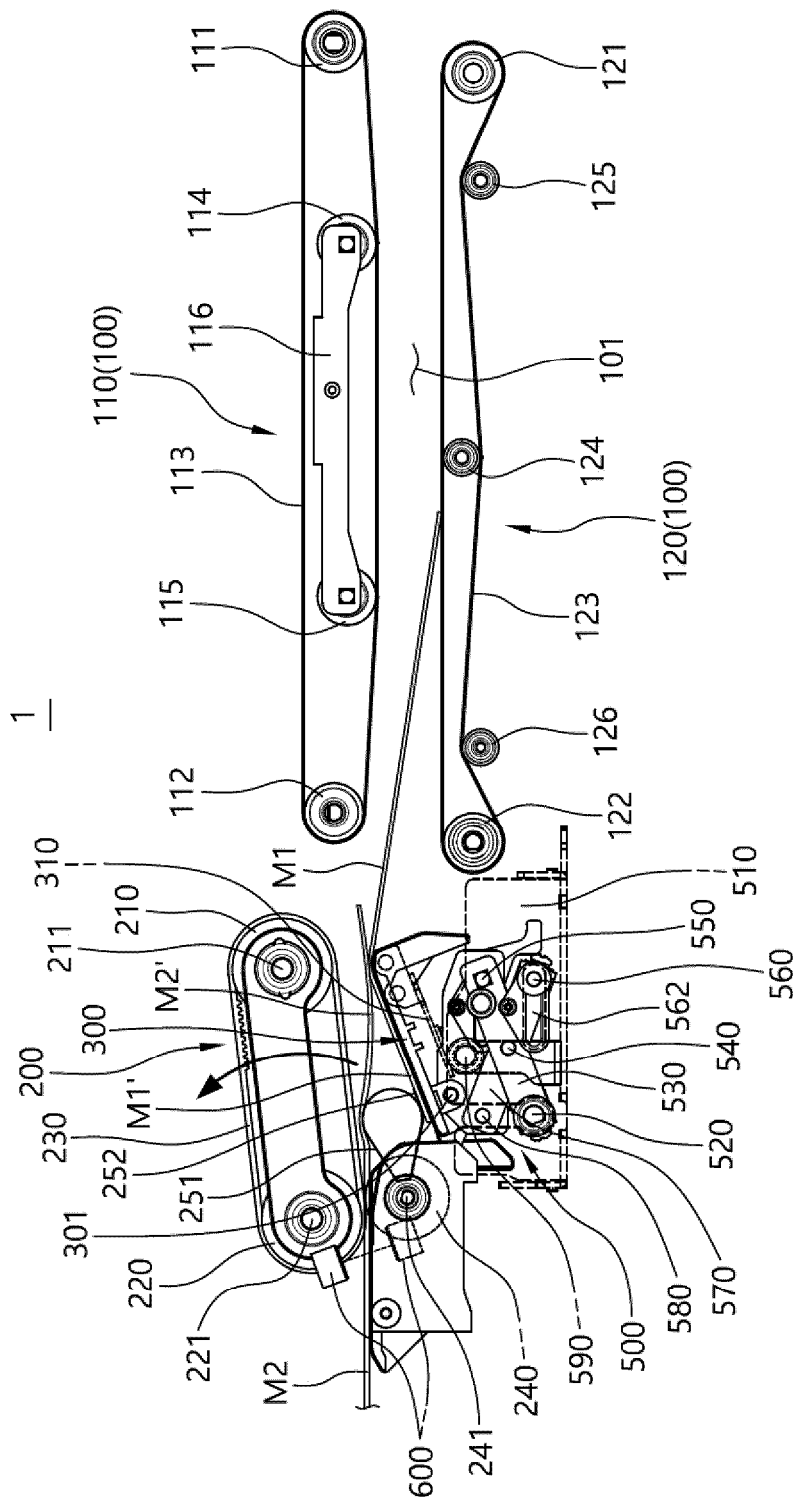
[FIG.6]



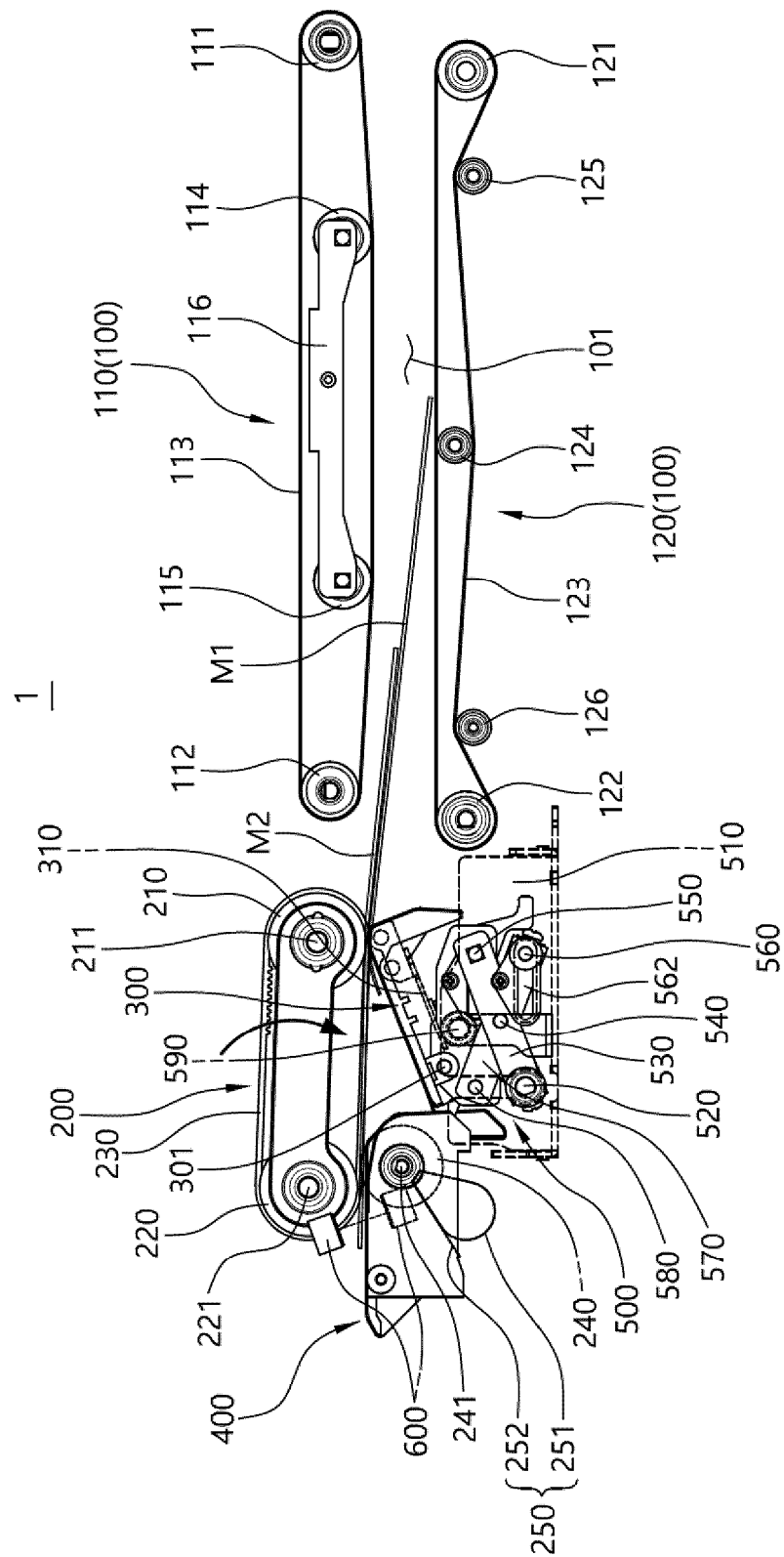
[FIG.7]



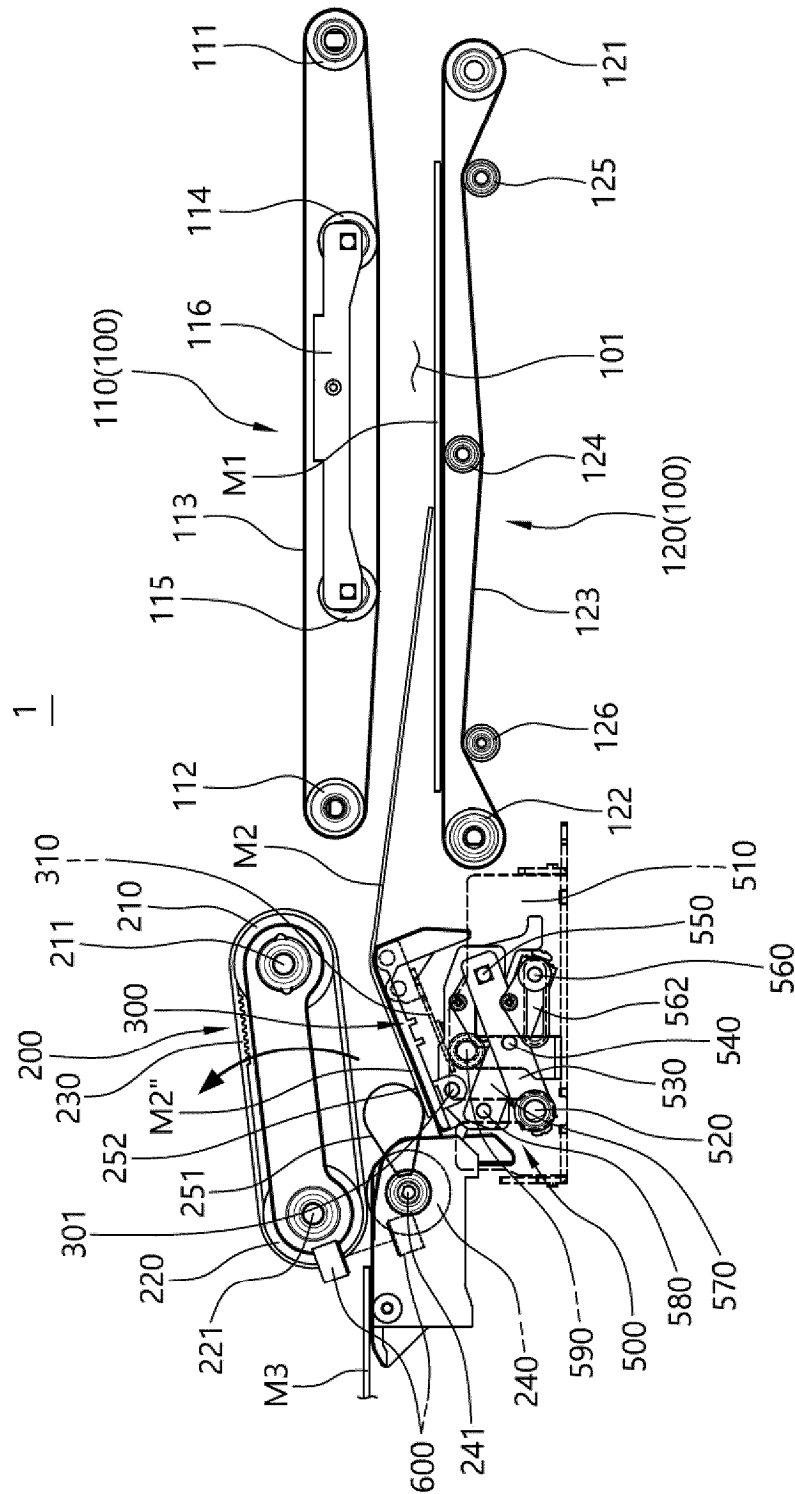
[FIG.8]



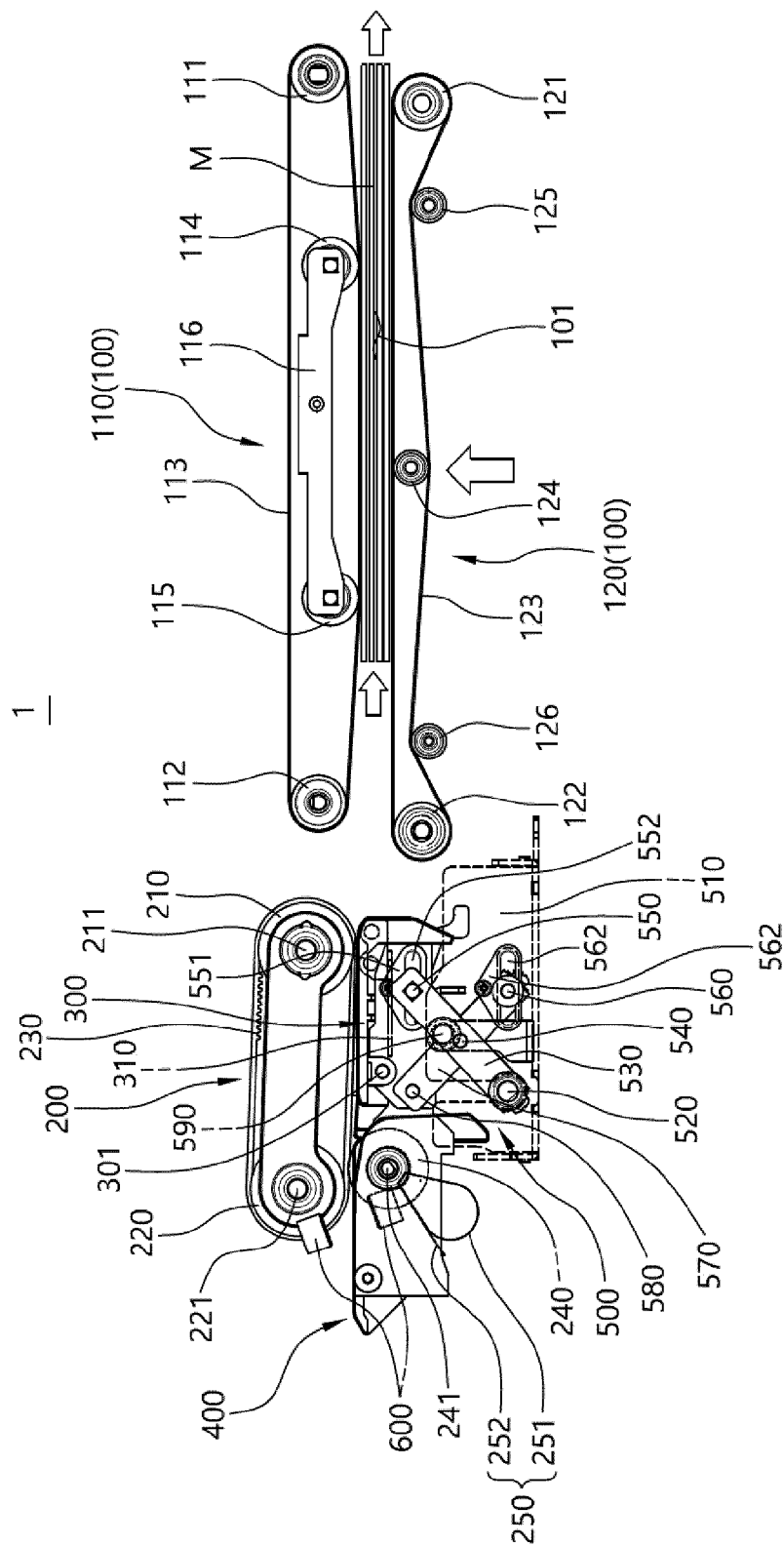
[FIG.9]



[FIG.10]



[FIG.11]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2024/020153

A. CLASSIFICATION OF SUBJECT MATTER**G07D 11/16**(2019.01)i; **G07D 11/22**(2019.01)i; **G07F 19/00**(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G07D 11/16(2019.01); B65H 29/12(2006.01); B65H 29/22(2006.01); B65H 29/62(2006.01); B65H 3/52(2006.01); B65H 31/26(2006.01); G07D 11/00(2006.01); G07D 11/12(2019.01); G07D 9/00(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models: IPC as above

Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS (KIPO internal) & keywords: 현금 자동 입출금기(automated teller machine), 지폐(bill), 리젝트(reject), 겹침(overlap), 잼(jam)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2022-0050410 A (HYOSUNG TNS INC.) 25 April 2022 (2022-04-25) See paragraphs [0053]-[0058], claim 1 and figures 10-13.	1-10
A	JP 2017-079036 A (NEC MAGNUS COMMUNICATIONS LTD.) 27 April 2017 (2017-04-27) See paragraphs [0016]-[0025] and figures 1-7.	1-10
A	KR 10-2017-0006087 A (NAUTILUS HYOSUNG INC.) 17 January 2017 (2017-01-17) See paragraph [0046] and figure 1.	1-10
A	JP 09-227002 A (SHIBAURA ENGINEERING WORKS CO., LTD.) 02 September 1997 (1997-09-02) See paragraphs [0031]-[0035] and figure 4.	1-10
A	JP 2012-126551 A (CANON INC.) 05 July 2012 (2012-07-05) See paragraph [0034] and figure 3.	1-10

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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“&” document member of the same patent family

Date of the actual completion of the international search

07 March 2025

Date of mailing of the international search report

07 March 2025

Name and mailing address of the ISA/KR

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Authorized officer

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2024/020153

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
KR	10-2022-0050410	A	25 April 2022	None			
JP	2017-079036	A	27 April 2017	JP	6600828	B2	06 November 2019
KR	10-2017-0006087	A	17 January 2017	KR	10-1776386	B1	07 September 2017
JP	09-227002	A	02 September 1997	None			
JP	2012-126551	A	05 July 2012	JP	5780749	B2	16 September 2015
				US	2012-0153561	A1	21 June 2012
				US	8511674	B2	20 August 2013