(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 385 621 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
19.06.2024 Bulletin 2024/25

(21) Application number: **23188347.1**

(22) Date of filing: **28.07.2023**

(51) International Patent Classification (IPC):
B02C 18/00 *(2006.01)* ***B02C 18/22*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B02C 18/0007; B02C 18/2283; B02C 2018/003; B02C 2018/0046

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(30) Priority: **15.12.2022 CN 202223369337 U**
29.06.2023 CN 202310784670

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(54) PAPER SHREDDER

(57) Provided is a paper shredder, belonging to the technical field of paper shredding. A housing (110, 120) of the paper shredder is provided with a paper feeding slot for passing stack of paper, a conveyer (300) for driving the stack of paper to move is disposed inside the paper feeding slot, two cutters (200) are used for shredding the stack of paper, a staple removing structure (500) is disposed on a first wall (101), and a staple removing edge (501) of the staple removing structure (500) is disposed inside the paper feeding slot to form a step structure. The staple removing edge (501) is spaced from a second wall (102), and the clearance between the staple removing edge (501) and the second wall (102) is used for paper feeding. In addition, in the conveying direction of the stack of paper, the distance from the two cutters (200) to the staple removing edge (501) is less than the length of the stack of paper.

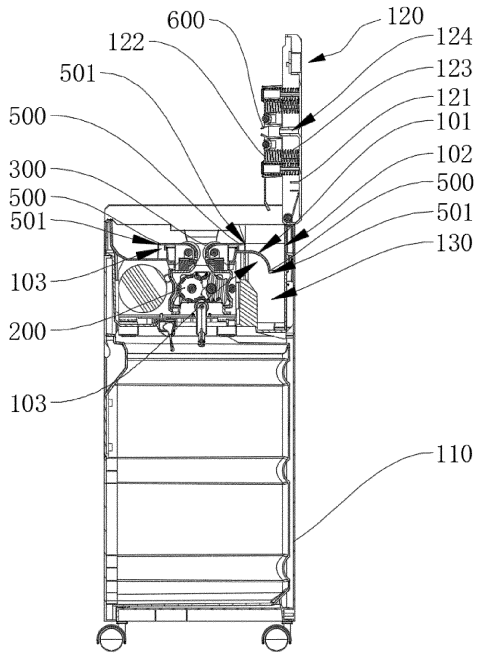

FIG. 3

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Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to Chinese utility model application No. 2022233693379 filed with the CNIPA on December 15, 2022, and Chinese patent application No. 202310784670.6 filed with the CNIPA on June 29, 2023, the invention of which is incorporated herein by reference in its entirety.

FIELD OF INVENTION

[0002] The present invention relates to a paper shredder, and more particularly to an auto feed paper shredder.

BACKGROUND OF THE INVENTION

[0003] An auto feed paper shredder is mainly used for shredding waste papers. In practice, waste papers in stack are placed in the paper compartment and one by one to be conveyed to cutter to shred. However, the waste papers are usually bound with staples or paper clips, which in case are synchronously following the waste paper into the cutter may likely damage the cutter and affect the service life of the paper shredder.

[0004] In this regard, the related art provides a paper shredder having a staple removing structure. The staple removing structure is disposed on the wall of a paper feeding slot and protrudes towards the inside of the paper feeding slot opposite to the wall of the paper feeding slot to form a step structure. The step structure is used for blocking the movements of staples. Ends of the stack of paper are driven by a conveyer to move towards a cutter while the other ends of the stack of paper having staples cannot continuously move under the blocking of the staple removing structure to tear the stack of paper so that the stack of paper can be torn off the staples. The tom-off stack of paper continuously moves to the cutter for shredding, while the staples cannot move towards the cutter under the blocking of the staple removing structure so that the staples can be prevented from entering the cutter. However, the existing problem is that the stack of paper needs to be torn off the staples, while the conveyor is generally a roller that cannot provide a relatively large tearing force, so the stack of paper is likely to slip, resulting in a failure in paper feeding.

SUMMARY OF THE INVENTION

[0005] The present invention provides a paper shredder to solve the problem in the related art that a conveyer of the paper shredder is generally a roller that cannot provide a relatively large tearing force for stack of paper, so the stack of paper is likely to slip, resulting in a failure in paper feeding. A paper shredder according to the invention is defined in independent claim 1. The dependent claims define preferred embodiments thereof.

[0006] To achieve the preceding object, the present invention provides the technical solutions below.

[0007] A paper shredder includes a housing, two cutters rotatably disposed on the housing and a conveyer disposed on the housing. The housing is provided with a paper feeding slot for passing stack of paper. The paper feeding slot is provided with a first wall and a second wall that are disposed opposite to each other. The conveyer is disposed inside the paper feeding slot and is used for conveying the stack of paper located inside the paper feeding slot to the two cutters. The two cutters work together to shred the stack of paper.

[0008] The paper shredder further includes a staple removing structure disposed on the first wall. The staple removing structure is provided with a staple removing edge. The staple removing edge is disposed inside the paper feeding slot and spaced from the second wall. The staple removing edge is capable to block movement of a staple or a paper clip disposed on the stack of paper. In a conveying direction of the stack of paper, a distance from the two cutters to the staple removing edge is less than a length of the stack of paper.

[0009] Preferably, a cavity for the stack of paper to extend into is provided between the staple removing edge and the first wall.

[0010] Preferably, multiple staple removing structures are provided, and the multiple staple removing structures are spaced from each other in the conveying direction of the stack of paper.

[0011] Preferably, the paper feeding slot includes a left-side paper feeding slot, a right-side paper feeding slot and a paper shredding passage, an intersection between the left-side paper feeding slot and the right-side paper feeding slot communicates with the paper shredding passage, and the two cutters are located on two sides of the paper shredding passage.

[0012] Preferably, multiple staple removing structures are provided, part of the multiple staple removing structures are disposed in the left-side paper feeding slot, and another part of the multiple staple removing structures are disposed in the right-side paper feeding slot.

[0013] Preferably, the conveyer includes two feeding roller assembly rotatably disposed on the housing, and one of the two feeding roller assembly is disposed inside the left-side paper feeding slot, and another of the two feeding roller assembly is disposed inside the right-side paper feeding slot.

[0014] Preferably, the housing includes a housing body and a cover detachably connected to the housing body, the housing body is provided with an opening, and the cover is used for closing the opening.

[0015] Preferably, the paper shredder further includes a protruding pressor disposed on the cover, and the protruding pressor is disposed on the intersection between the left-side paper feeding slot and the right-side paper feeding slot and extends towards the paper shredding passage.

[0016] Preferably, the cover includes a cover body, a

mounting plate connected to the cover body and a resilient member disposed between the cover body and the mounting plate, the protruding pressor is disposed on the mounting plate, and the resilient member is used for providing a resilient force to keep the mounting plate away from the cover body.

[0017] Preferably, the housing is further provided with a paper compartment for storing the stack of paper, and the paper compartment communicates with a side of the paper feeding slot facing away from the two cutters.

[0018] The present invention has the beneficial effects below.

[0019] The present invention provides the paper shredder. The housing of the paper shredder is provided with the paper feeding slot for passing the stack of paper, the conveyer for driving the stack of paper to move is disposed inside the paper feeding slot, and the two cutters are used for shredding the stack of paper. The paper shredder further includes the staple removing structure disposed on the first wall, and the staple removing edge of the staple removing structure is disposed inside the paper feeding slot to form the step structure to play the role in blocking a staple or a paper clip disposed on the stack of paper. The staple removing edge is spaced from the second wall, and the clearance between the staple removing edge and the second wall is used for paper feeding. In addition, in the conveying direction of the stack of paper, the distance from the two cutters to the staple removing edge is less than the length of the stack of paper so that during the conveying process of the stack of paper, when the front ends of the stack of paper have just entered between the two cutters, the rear ends of the stack of paper still cannot pass through the staple removing structure, and when the stack of paper are continuously conveyed, and the rear ends of the stack of paper reach the staple removing structure, the staple removing edge can block the continuous movement of the staple or the paper clip. At this time, the front end of the stack of paper are torn by the two cutters, and the tearing force is relatively large so that the stack of paper can be easily torn off the staple or the paper clip, and the staple or the paper clip cannot continuously move under the blocking of the staple removing edge, thereby preventing the staple or the paper clip from entering the two cutters and thereby avoiding damage to the two cutters.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

FIG. 1 is view one illustrating the overall structure of a paper shredder according to an embodiment of the present invention;

FIG. 2 is view two illustrating the overall structure of a paper shredder according to an embodiment of the present invention;

FIG. 3 is a section view one of a paper shredder according to embodiment one of the present invention;

FIG. 4 is a section view two of a paper shredder according to embodiment one of the present invention;

FIG. 5 is a section view three of a paper shredder according to embodiment one of the present invention;

FIG. 6 is a view illustrating the structure of a conveyer according to embodiment one of the present invention;

FIG. 7 is a section view one of a paper shredder according to embodiment two of the present invention;

FIG. 8 is a section view two of a paper shredder according to embodiment two of the present invention; and

FIG. 9 is a section view three of a paper shredder according to embodiment two of the present invention.

100	housing
101	first wall
102	second wall
103	cavity
110	housing body
120	cover
121	cover body
122	mounting plate
123	resilient member
124	manual feeding slot
130	paper compartment
200	cutter
300	conveyer
301	feeding roller assembly
302	transmission shaft
303	transmission gear
400	stack of paper
500	staple removing structure
501	staple removing edge
600	protruding pressor

DETAILED DESCRIPTION

[0021] The present invention is further described hereinafter in detail in conjunction with drawings and embodiments. It is to be understood that the specific embodiments set forth below are intended to illustrate and not to limit the present invention. In addition, it is to be noted that for ease of description, only part, not all, of the structures related to the present invention are illustrated in the

drawings.

[0022] A paper shredder is mainly used for shredding waste papers. During use, stack of paper to be shredded are placed in the paper shredder in a stack, are conveyed to a cutter by a conveyer and are shredded by the cutter to complete automatic paper feeding and shredding. To prevent staples, paper clips and others bound on the stack of paper from entering the cutter, the related art provides a paper shredder having a staple removing structure. The staple removing structure is disposed on the wall of a paper feeding slot and protrudes towards the inside of the paper feeding slot opposite to the wall of the paper feeding slot to form a step structure. The step structure is used for blocking the movements of staples. Ends of the stack of paper are driven by a conveyer to move towards a cutter while the other ends of the stack of paper having staples cannot move under the blocking of the staple removing structure to tear the stack of paper so that the stack of paper can be torn off the staples. The torn-off stack of paper continuously moves to the cutter for shredding, while the staples still cannot move towards the cutter under the blocking of the staple removing structure. However, the existing problem is that the stack of paper needs to be torn off the staples, while the conveyor is generally a roller that cannot provide a relatively large tearing force, so the stack of paper is likely to slip, resulting in a failure in paper feeding.

[0023] In view of the preceding problem, one of the embodiments provides a paper shredder to solve the problem in the related art that the conveyer of the paper shredder is generally a roller that cannot provide a relatively large tearing force for the stack of paper, so the stack of paper is likely to slip, resulting in a failure in paper feeding. The paper shredder may be used in the technical field of paper shredding.

[0024] Referring to FIGS. 1 to 6, the paper shredder includes a housing 100, two cutters 200 rotatably disposed on the housing 100 and a conveyer 300 disposed on the housing 100. The housing 100 is provided with a paper feeding slot for passing stack of paper 400. The paper feeding slot is provided with a first wall 101 and a second wall 102 that are disposed opposite to each other. The conveyer 300 is disposed inside the paper feeding slot. The conveyer 300 may be specifically disposed on the first wall 101 or the second wall 102 and is used for conveying the stack of paper 400 located inside the paper feeding slot to the two cutters 200. The two cutters 200 can cooperate to shred the stack of paper 400. The paper shredder may convey the stack of paper 400 located inside the paper feeding slot to the two cutters 200 through the conveyer 300 and shred the stack of paper 400 through the cooperation of the two cutters 300 to complete automatic paper feeding and shredding.

[0025] With continued reference to FIGS. 1 to 6, the paper shredder further includes a staple removing structure 500 disposed on the first wall 101, and the staple removing structure 500 is provided with a staple removing edge 501 disposed inside the paper feeding slot to form a step structure so as to play the role in blocking a staple or a paper clip disposed on the stack of paper 400. The staple removing edge 501 is spaced from the second wall, and the clearance between the staple removing edge 501 and the second wall 102 is used for paper feeding. With such a configuration, the staple removing edge 501 can be disposed between the first wall 101 and the second wall 102, and during use, the stack of paper 400 can move close to the staple removing structure 500, and the staple removing edge 501 can block the movement of the staple or the paper clip disposed on the stack of paper 400 so as to play the role in blocking the staple or the paper clip disposed on the stack of paper 400.

[0026] With continued reference to FIGS. 1 to 6, in the conveying direction of the stack of paper 400, the distance from the two cutters 200 to the staple removing edge 501 is less than the length of the stack of paper 400 so that during the conveying process of the stack of paper 400, when the front ends of the stack of paper 400 have just entered between the two cutters 200, the rear ends of the stack of paper 400 still cannot pass through the staple removing structure 500, and when the stack of paper 400 are continuously conveyed, and the rear ends of the stack of paper 400 reach the staple removing structure 500, the staple removing edge 501 can block the continuous movements of the staples or the paper clips. At this time, the front ends of the stack of paper 400 are torn by the two cutters 200, and the tearing force of the two cutters 200 is relatively large so that the stack of paper 400 can be easily torn off the staple or the paper clip, and the staple or the paper clip cannot continuously move under the blocking of the staple removing edge 501, thereby preventing the staple or the paper clip from entering the two cutters 200 and thereby avoiding damage to the two cutters 200.

[0027] Preferably, the preceding removing structure 500 has two solutions below.

[0028] One solution is the following: The staple removing structure 500 is a protruding pressor protruding towards the second wall 102, that is, the staple removing structure 500 and the first wall 101 form a step, and the staple removing edge 510 is located at the tip of the step to play the role in staple removing.

[0029] This embodiment adopts the other solution. As shown in FIGS. 1 to 6, a cavity 103 for the stack of paper 400 to extend into is provided between the staple removing edge 501 and the first wall 101 so that the cavity 103 is formed between the staple removing edge 501 and the first wall 101. In the process of the stack of paper 400 being torn, the front ends of the stack of paper 400 are located between the two cutters 200, and the rear ends of the stack of paper 400 bound with the staples or the paper clips may enter the cavity 103 between the staple removing edge 501 and the first wall 101 so that the staples or the paper clips can be further prevented from continuously moving with the stack of paper 400, and the staple removing edge 501 can provide an applied force for tearing for the rear ends of the stack of paper 400 to

facilitate the stack of paper 400 being successfully torn.

[0030] With continued reference to FIGS. 1 to 6, multiple staple removing structures 500 are provided, and the multiple staple removing structures 500 are spaced from each other in the conveying direction of the stack of paper 400. When one staple removing structure 500 fails due to accidental factors, the staple or the paper clip can be blocked again through the other staple removing structures 500 to further prevent the staple or the paper clip from entering the two cutters 200.

[0031] With continued reference to FIGS. 1 to 6, the paper feeding slot includes a left-side paper feeding slot, a right-side paper feeding slot and a paper shredding passage, an intersection between the left-side paper feeding slot and the right-side paper feeding slot communicates with the paper shredding passage, and the two cutters 200 are located on two sides of the paper shredding passage. Part of the stack of paper 400 may be placed in the left-side paper feeding slot and the other stack of paper 400 is placed in the right-side paper feeding slot, and under the action of the conveyer 300, the middle portion of the stack of paper 400 is bent towards the paper shredding passage. The middle portion of the stack of paper 400 first enters between the two cutters 200, while two ends of the stack of paper 400 enter between the two cutters 200 in the subsequent process.

[0032] With continued reference to FIGS. 1 to 6, since the bound positions of the staples or the paper clips of the stack of paper 400 are not uniform, some staples or paper clips of the stack of paper 400 are bound on the left side, and the others are bound on the right side. Therefore, to further prevent the staples or the paper clips from entering the two cutters 200, the left-side paper feeding slot and the right-side paper feeding slot each needs to have the function of blocking the staples or the paper clips. Preferably, part of the multiple staple removing structures 500 are disposed on the left-side paper feeding slot and another part of the multiple staple removing structures 500 are disposed on the right-side paper feeding slot. In this embodiment, the left-side paper feeding slot is provided with one staple removing structure 500, and the right-side paper feeding slot is provided with two staple removing structures 500.

[0033] Preferably, the right-side paper feeding slot is bent and is provided with a first passage and a second passage that communicate with each other. The first passage extends in a horizontal direction and communicates with the left-side paper feeding slot and the paper shredding passage to accommodate the stack of paper 400 having a relatively long size. Between the two staple removing structures 500 of the right-side paper feeding slot, one staple removing structure 500 is disposed inside the first passage while the other staple removing structure 500 is disposed inside the second passage.

[0034] In this embodiment, a cavity 103 for the stack of paper 400 to extend into is provided between each staple removing edge 501 of all the staple removing structures 500 and the first wall 101 to achieve an optimal staple removing effect.

[0035] In other embodiments, a cavity 103 is provided between each staple removing edge 501 of part of the staple removing structures 500 and the first wall 101 while a cavity 103 is not provided between each staple removing edge 501 of the other part of the staple removing structures 500 and the first wall 101. Preferably, a cavity 103 is provided between each staple removing edge 501 of staple removing structures 500 disposed inside the first passage and the first wall 101, and a cavity 103 is not provided between each staple removing edge 501 of staple removing structures 500 disposed inside the second passage and the first wall 101. In addition, a cavity 103 may not be provided between the staple removing edge 501 of the staple removing structures 500 disposed inside the first passage and the first wall 101, and a cavity 103 may be provided between the staple removing edge 501 of the staple removing structures 500 disposed inside the second passage and the first wall 101. Those skilled in the art can flexibly set according to actual requirements and combine more structures.

[0036] With continued reference to FIG. 6, the conveyer 300 includes two feeding roller assembly 301 rotatably disposed on the housing 100, one of the two feeding roller assembly 301 is disposed inside the left-side paper feeding slot and the other one of the two feeding roller assembly 301 is disposed inside the right-side paper feeding slot. Two feeding roller assembly 301 include multiple rollers that are spaced from each other, and the multiple rollers drive the stack of paper 400 to move. Preferably, the conveyer 300 further includes a transmission shaft 302 rotatably disposed on the housing 100. The multiple rollers of the feeding roller assembly 301 are disposed on the transmission shaft 302 and can be driven by the transmission shaft 302 to synchronously rotate. An end of the transmission shaft 302 is provided with a transmission gear 303, and a driving member such as a motor drives the transmission gear 303 to rotate so as to drive the transmission shaft 302 to rotate.

[0037] With continued reference to FIGS. 1 to 6, the housing 100 includes a housing body 110 and a cover 120 detachably connected to the housing body 110. The housing body 110 is provided with an opening, and the cover 120 is used for closing the opening so that a left-side paper feeding slot and a right-side paper feeding slot can be formed between the cover 120 and the housing body 110.

[0038] With continued reference to FIGS. 1 to 6, the paper shredder further includes a protruding pressor 600 disposed on the cover 120. The protruding pressor 600 is disposed on the intersection between the left-side paper feeding slot and the right-side paper feeding slot and extends towards the paper shredding passage, so that the stack of paper 400 can be pushed by the protruding pressor 60 to bend to easily enter the paper shredding passage. Preferably, one of the two feeding roller assembly 301 is disposed on the intersection between the left-side paper feeding slot and the paper shredding passage

while the other one of the two feeding roller assembly 301 is disposed on the intersection between the right-side paper feeding slot and the paper shredding passage, and the stack of paper 400 may be pushed by the protruding pressor 600 towards the two feeding roller assembly 301 so that the two feeding roller assembly 301 can provide a relatively large driving force for the stack of paper 400.

[0039] Preferably, the cover 120 is provided with a manual feeding slot 124 right facing the paper shredding passage, so a user may directly put the stack of paper 400 into the paper shredding passage through the manual feeding slot 124. In an example, the manual feeding slot 124 sequentially passes through the cover 120 and the protruding pressor 600.

[0040] With continued reference to FIGS. 1 to 6, the cover 120 includes a cover body 121, a mounting plate 122 connected to the cover body 121, and a resilient member 123 disposed between the cover body 121 and the mounting plate 122, the protruding pressor 600 is disposed on the mounting plate 122, and the resilient member 123 is used for providing a resilient force to keep the mounting plate 122 away from the cover body 121, so that the protruding pressor 600 can be pushed by the resilient member 123 to move towards the paper shredding passage to drive the stack of paper 400 to move and can adapt to the stack of paper 400 stacked in different thicknesses.

[0041] With continued reference to FIGS. 1 to 6, the housing 100 is further provided with a paper compartment 130 for storing the stack of paper 400, and the paper compartment 130 communicates with a side of the paper feeding slot facing away from the two cutters 200. The paper compartment 130 is provided with two paper compartment walls. One of the two paper compartment walls is connected to the first wall 101 and the other one of the two paper compartment walls is connected to the second wall 102, and the distance between the two paper compartment walls is less than the distance between the first wall 101 and the second wall 102 so that the paper compartment 130 can store more stack of papers 400.

[0042] This embodiment provides another paper shredder. The paper shredder has the basic same structures as the paper shredder in embodiment one. The differences are that the number and positions of staple removing structures 500 and the number of paper compartments 130 are different.

[0043] Referring to FIGS. 7 to 9, in this embodiment, two paper compartments 130 are provided, one of the two paper compartments 130 communicates with the left-side paper feeding slot and the other one of the two paper compartments 130 communicates with the right-side paper feeding slot so that the two paper compartments can adapt to the stack of paper 400 having a relatively large length. Preferably, the left-side paper feeding slot and the right-side paper feeding slot are bent to increase the length of stack of paper 400 that may be accommodated. In addition, in this embodiment, the left-side paper feeding slot is provided with two staple removing structures 500, the right-side paper feeding slot is also provided with two staple removing structures 500, and the staple removing structures 500 on two sides are symmetrically distributed. With such a configuration, a better role in staple removing can be played for staples or paper clips bound on the left and right sides of the stack of paper 400.

[0044] Apparently, the preceding embodiments of the present invention are only illustrative of the present invention and are not intended to limit the implementations of the present invention. Those of ordinary skill in the art can make various apparent modifications, adaptations and substitutions without departing from the scope of the present invention. All examples cannot be and do not need to be exhausted herein. Any modifications, equivalent substitutions and improvements made within the principle of the present invention fall within the scope of the claims of the present invention.

Claims

1. A paper shredder, comprising a housing (100), two cutters (200) rotatably disposed on the housing (100) and a conveyer (300) disposed on the housing (100), wherein the housing (100) is provided with a paper feeding slot for passing stack of paper (400), the paper feeding slot is provided with a first wall (101) and a second wall (102) that are disposed opposite to each other, the conveyer (300) is disposed inside the paper feeding slot and is used for conveying the stack of paper (400) located inside the paper feeding slot to the two cutters (200), and the two cutters (200) are capable of cooperating to shred the stack of paper (400); and the paper shredder further comprising:
   a staple removing structure (500) disposed on the first wall (101), wherein the staple removing structure (500) is provided with a staple removing edge (501), the staple removing edge (501) is disposed inside the paper feeding slot and spaced from the second wall (102), the staple removing edge (501) is capable of blocking movement of a staple or a paper clip disposed on the stack of paper (400), and in a conveying direction of the stack of paper (400), a distance from the two cutters (200) to the staple removing edge (501) is less than a length of the stack of paper (400).

2. The paper shredder according to claim 1, wherein a cavity (103) for the stack of paper (400) to extend into is provided between the staple removing edge (501) and the first wall (101).

3. The paper shredder according to claim 1 or 2, wherein a plurality of staple removing structures (500) are provided, and the plurality of staple removing structures (500) are spaced from each other in the conveying direction of the stack of paper (400).

4. The paper shredder according to any one of claims 1 to 3, wherein the paper feeding slot comprises a left-side paper feeding slot, a right-side paper feeding slot and a paper shredding passage, an intersection between the left-side paper feeding slot and the right-side paper feeding slot communicates with the paper shredding passage, and the two cutters (200) are located on two sides of the paper shredding passage.

5. The paper shredder according to claim 4, wherein a plurality of staple removing structures (500) are provided, part of the plurality of staple removing structures (500) are disposed in the left-side paper feeding slot, and another part of the plurality of staple removing structures (500) are disposed in the right-side paper feeding slot.

6. The paper shredder according to claim 4 or 5, wherein the conveyer (300) comprises two feeding roller assembly (301) rotatably disposed on the housing (100), one of the two feeding roller assembly (301) is disposed inside the left-side paper feeding slot, and another of the feeding roller assembly (301) is disposed inside the right-side paper feeding slot.

7. The paper shredder according to any one of claims 4 to 6, wherein the housing (100) comprises a housing body (110) and a cover (120) detachably connected to the housing body (110), the housing body (110) is provided with an opening, and the cover (120) is used for closing the opening.

8. The paper shredder according to claim 7, further comprising a protruding pressor (600) disposed on the cover (120), wherein the protruding pressor (600) is disposed on the intersection between the left-side paper feeding slot and the right-side paper feeding slot and extends towards the paper shredding passage.

9. The paper shredder according to claim 8, wherein the cover (120) comprises a cover body (121), a mounting plate (121) connected to the cover body (121) and a resilient member (123) disposed between the cover body (121) and the mounting plate (122), the protruding pressor (600) is disposed on the mounting plate (122), and the resilient member (123) is used for providing a resilient force to keep the mounting plate (122) away from the cover body (121).

10. The paper shredder according to any one of claims 1 to 9, wherein the housing (100) is further provided with a paper compartment (130) for storing the stack of paper (400), and the paper compartment (130) communicates with a side of the paper feeding slot facing away from the two cutters (200).

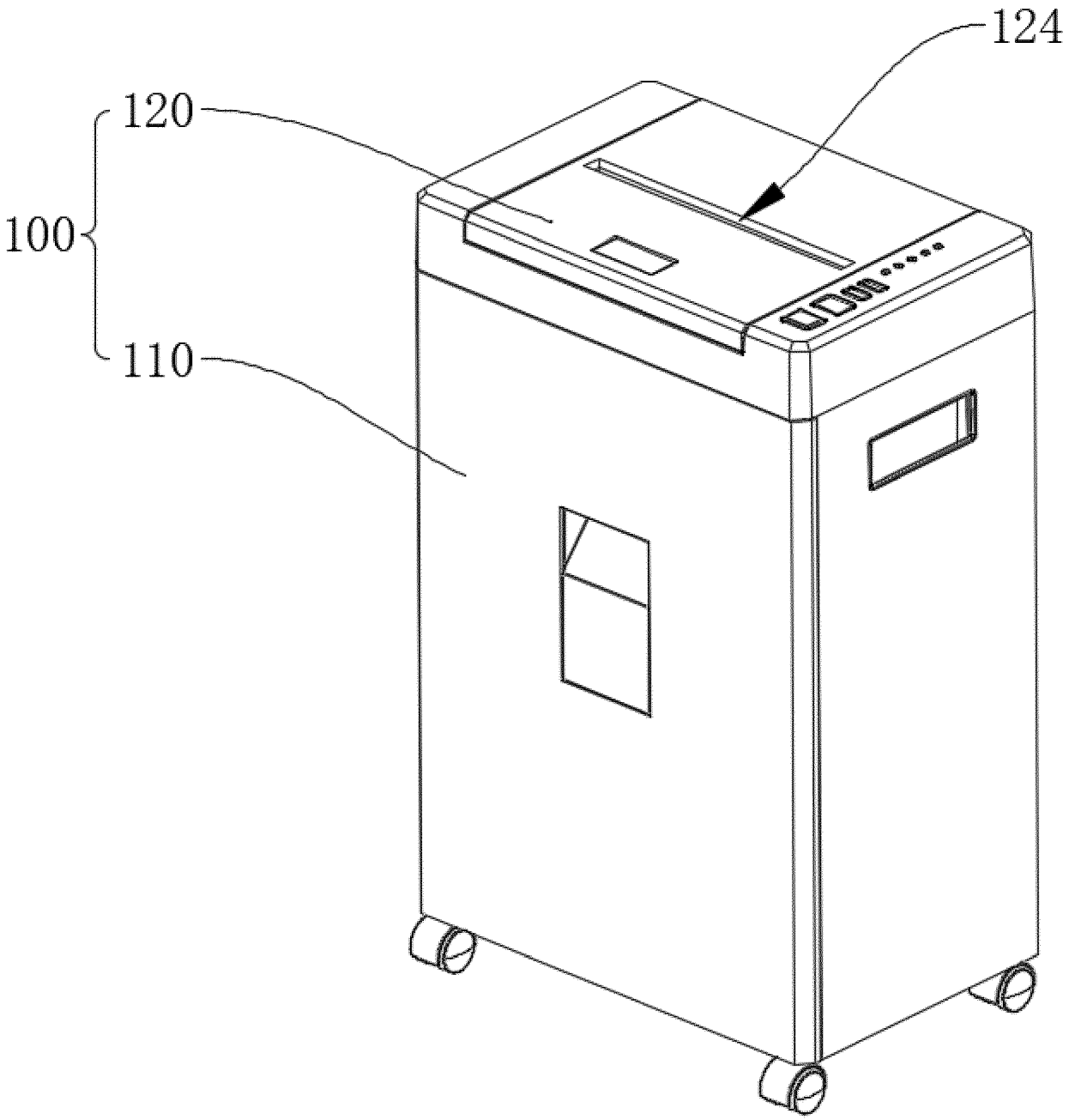


FIG. 1

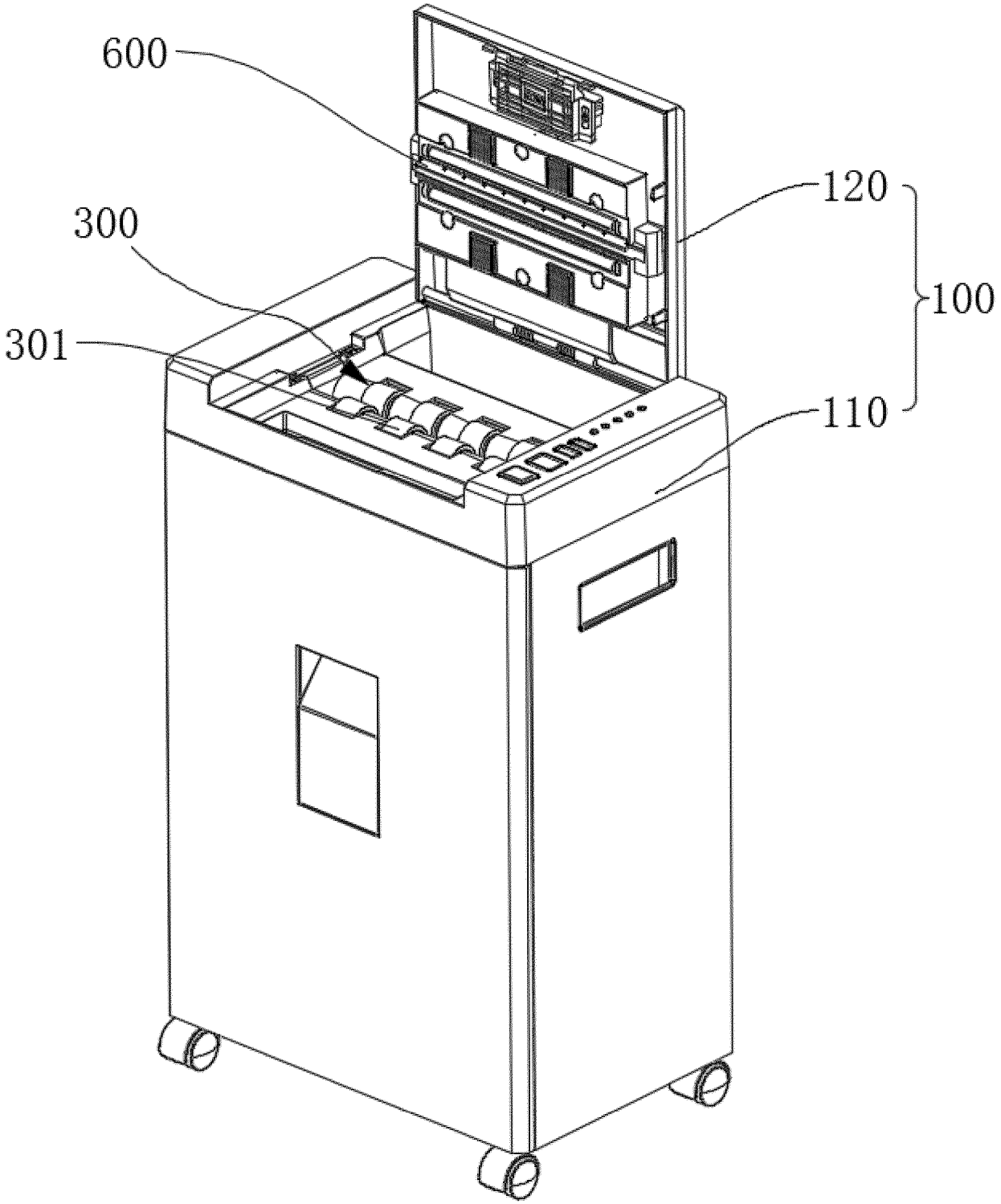
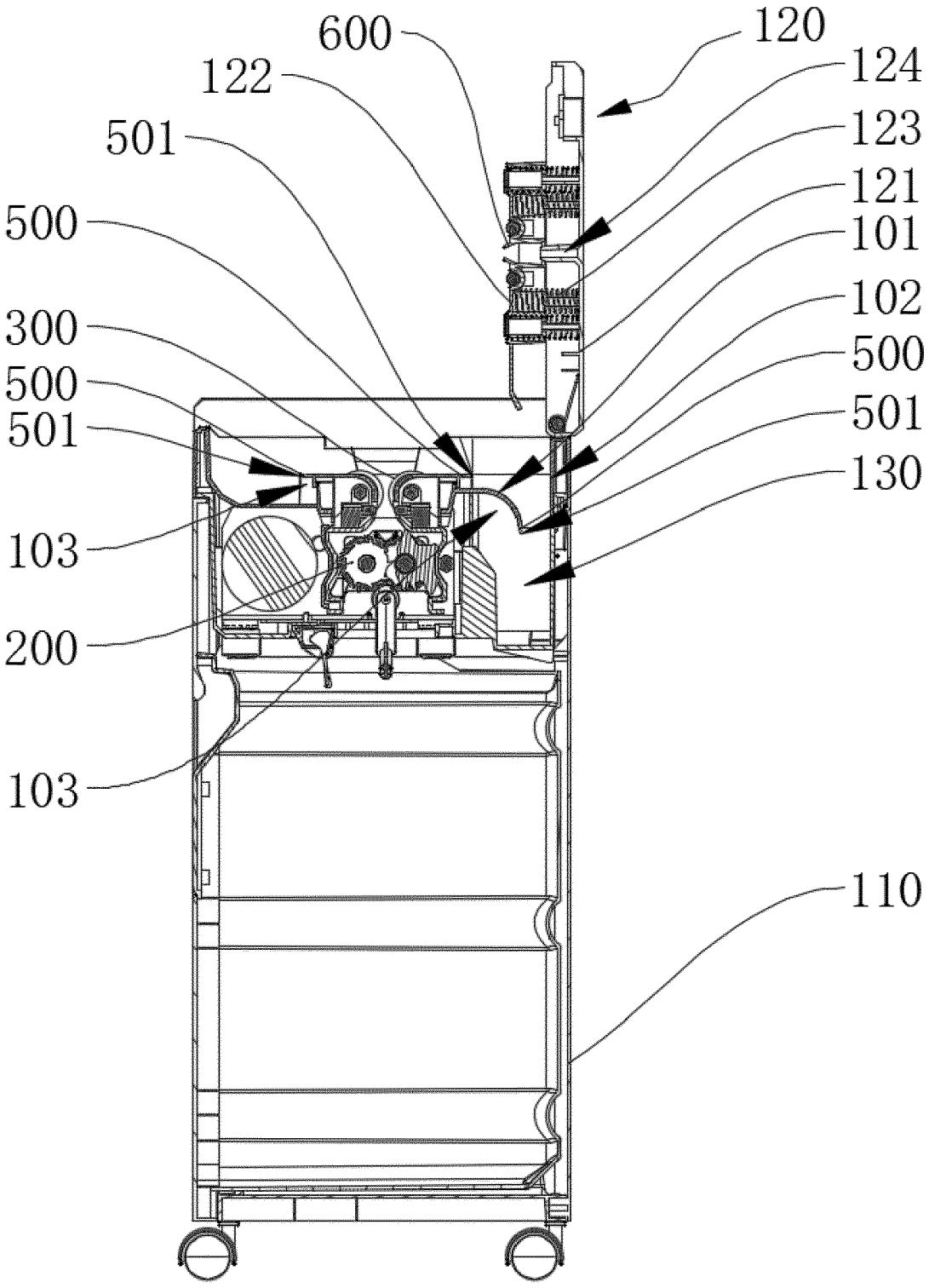


FIG. 2


600
120
122
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123
121
500
101
102
300
500
500
501
130
501
103
200
103
110

FIG. 3

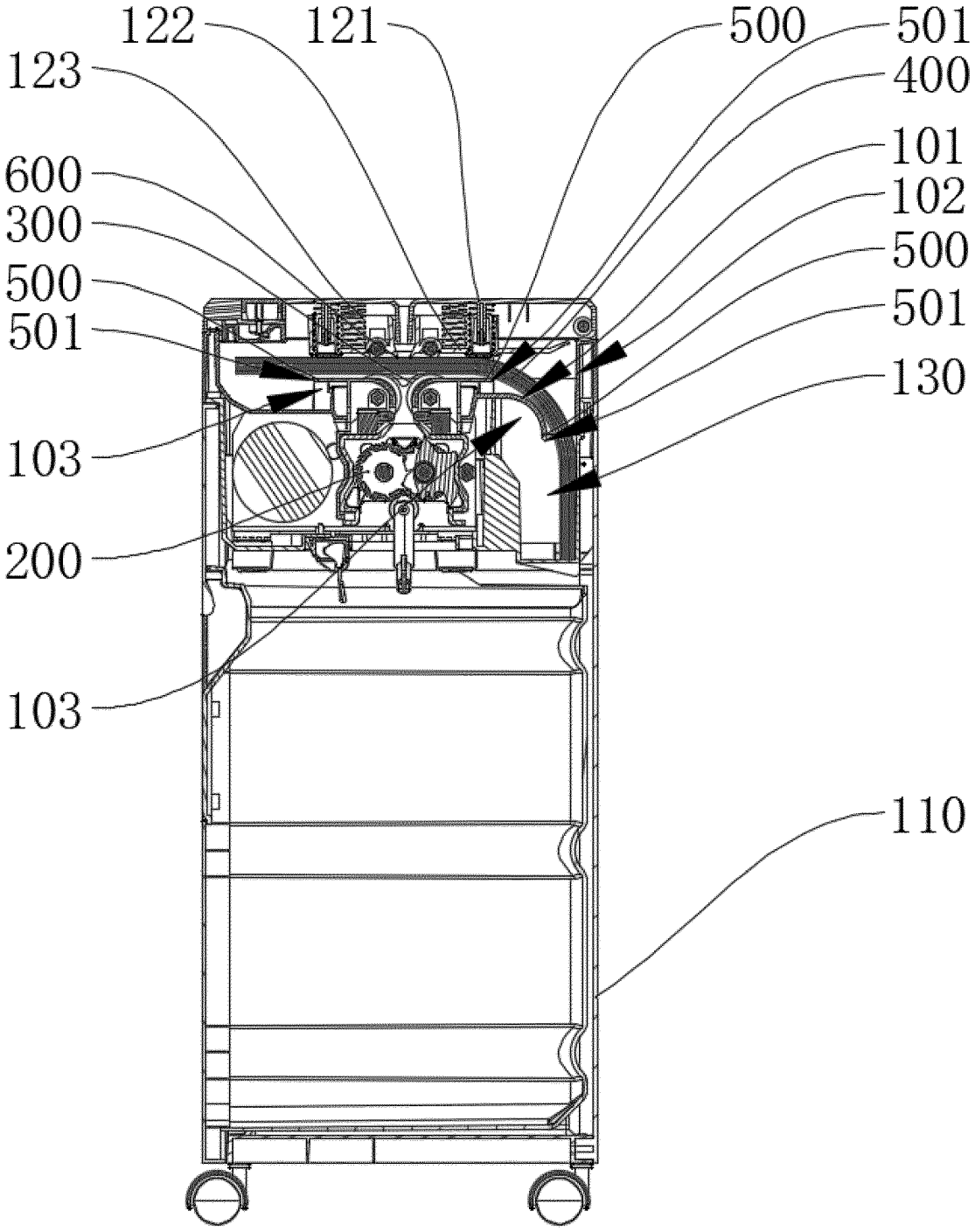
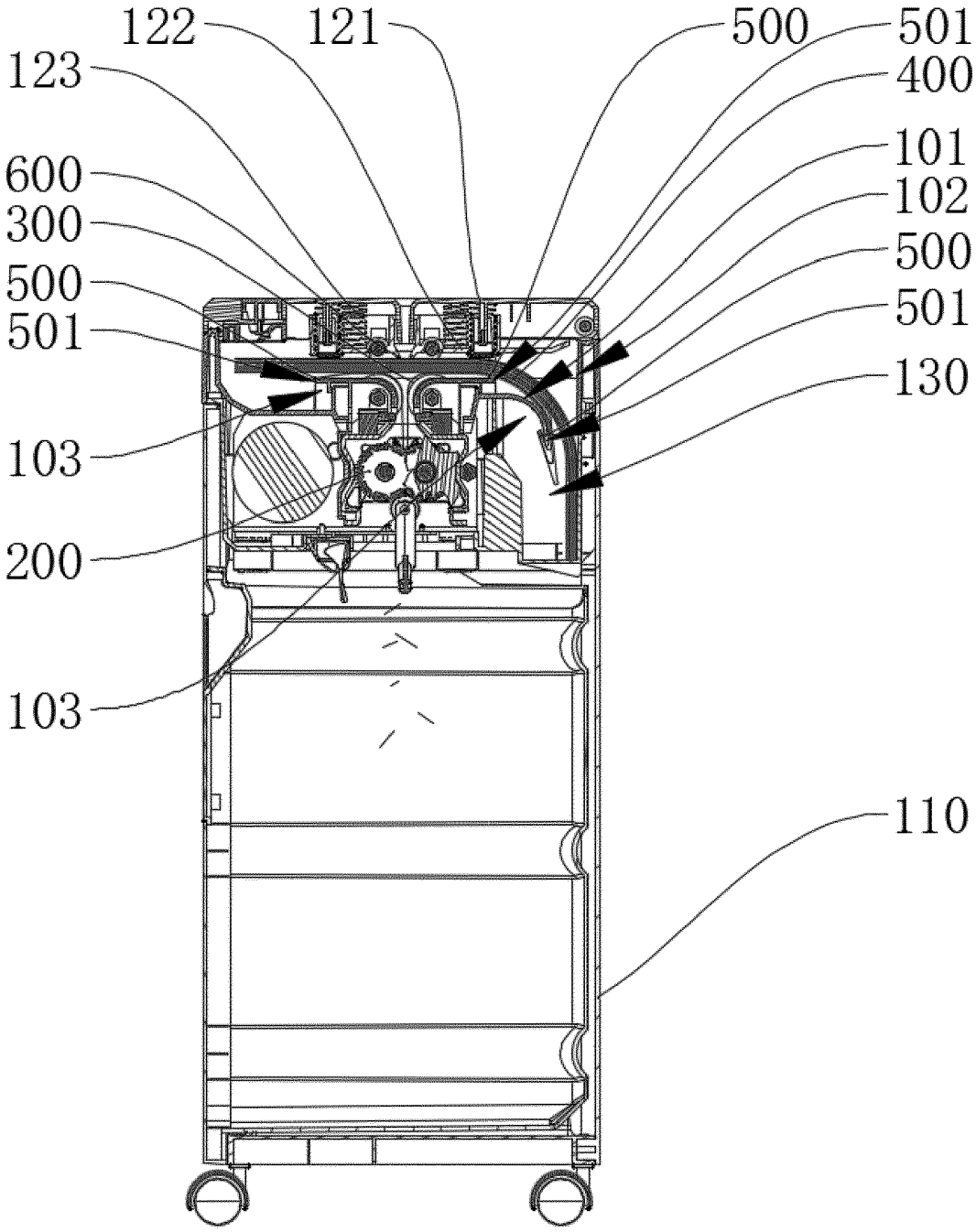

122
121
500
501
123
400
101
600
102
300
500
500
501
501
130
103
200
103
110

FIG. 4


122
121
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501
123
400
101
600
102
300
500
500
501
501
130
103
200
103
110

FIG. 5

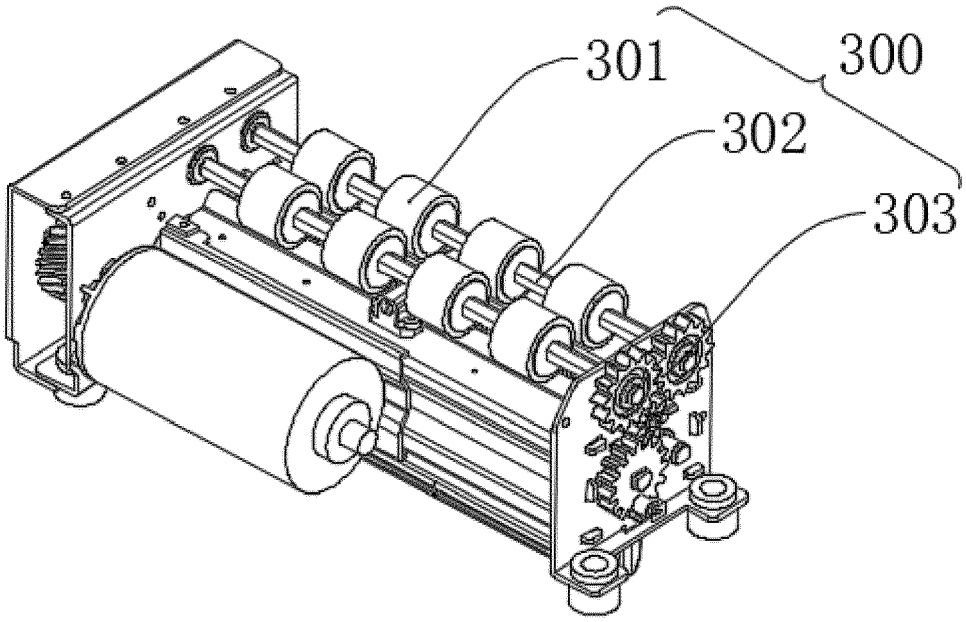

FIG. 6

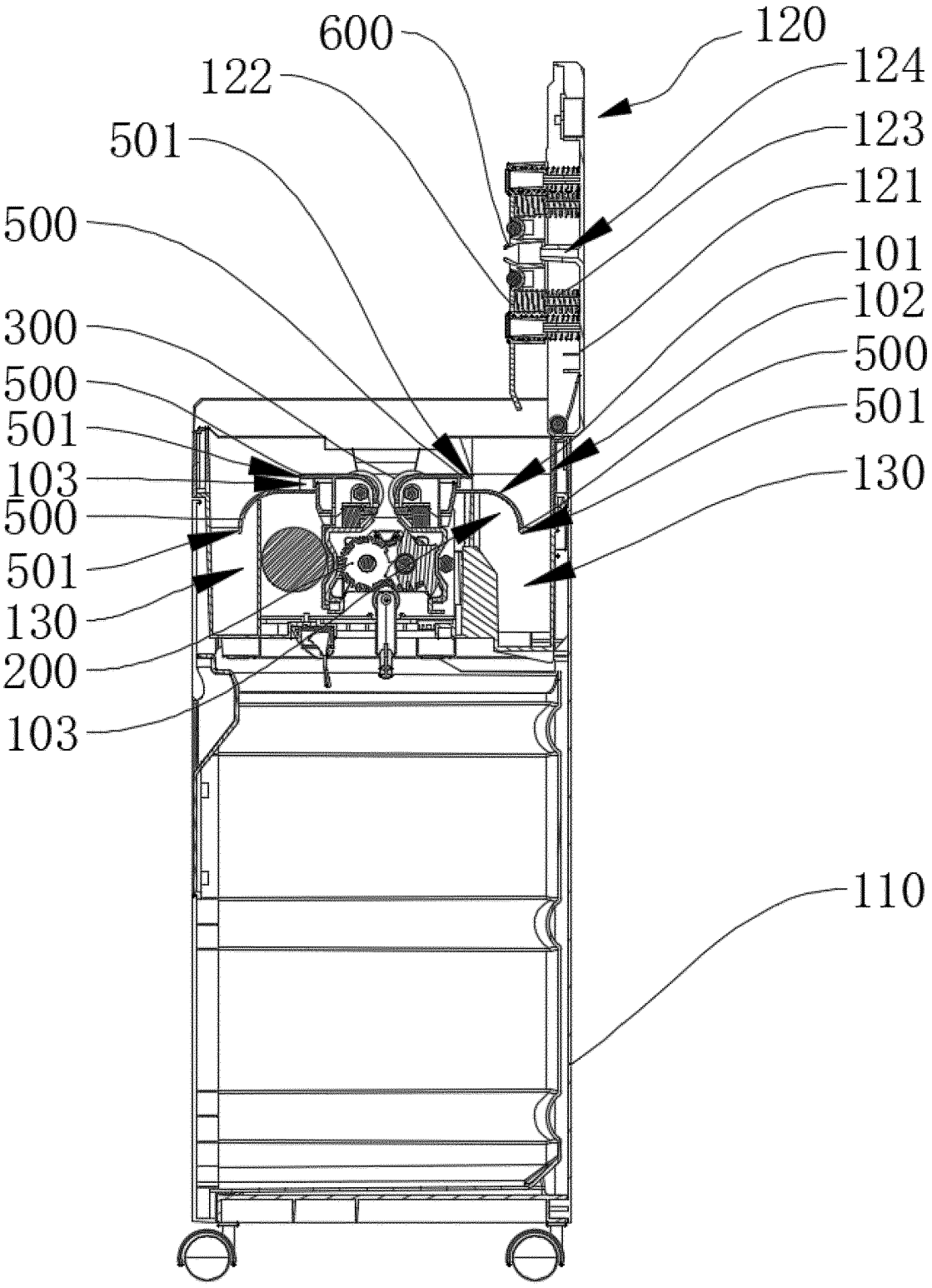
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FIG. 7

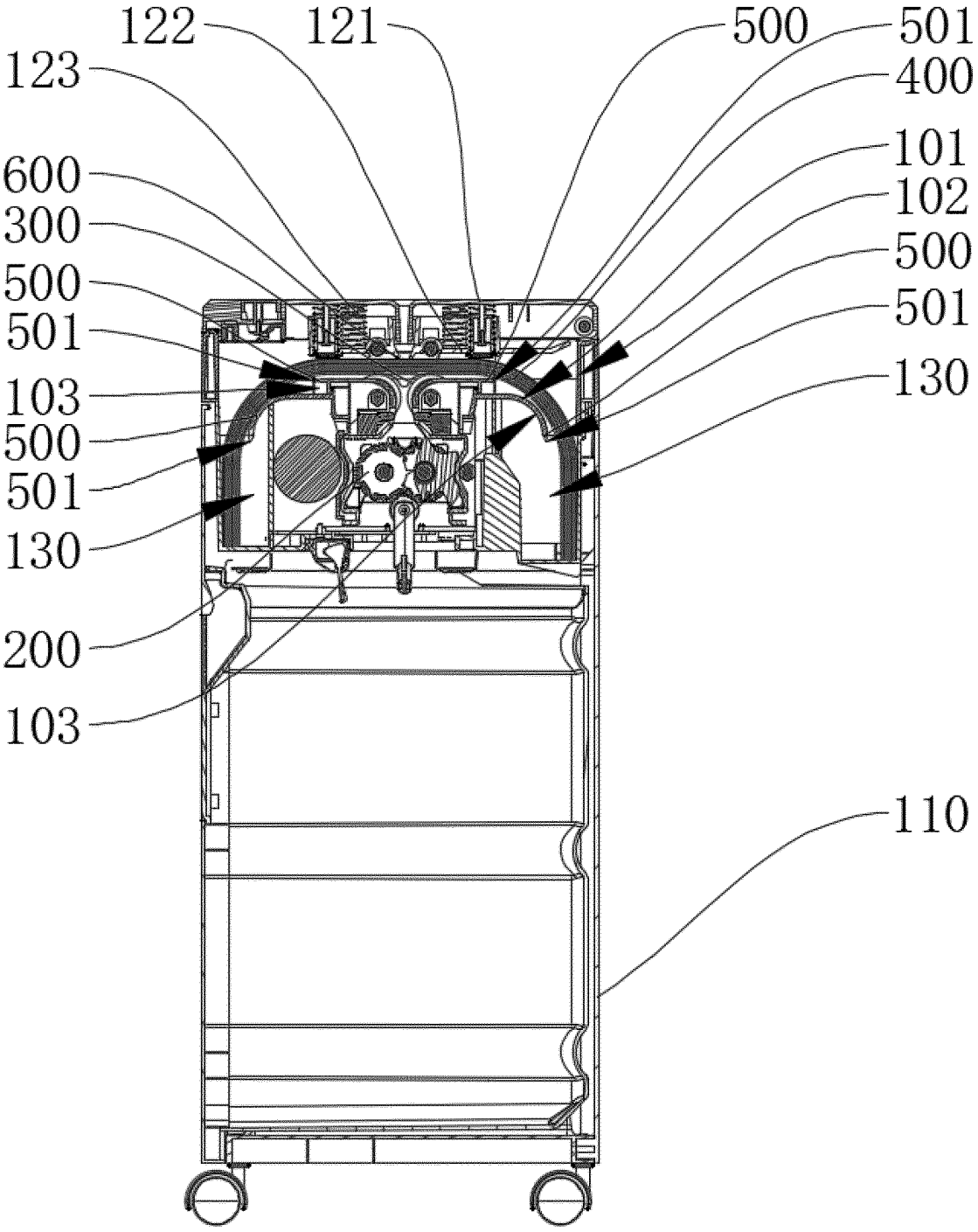
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FIG. 8

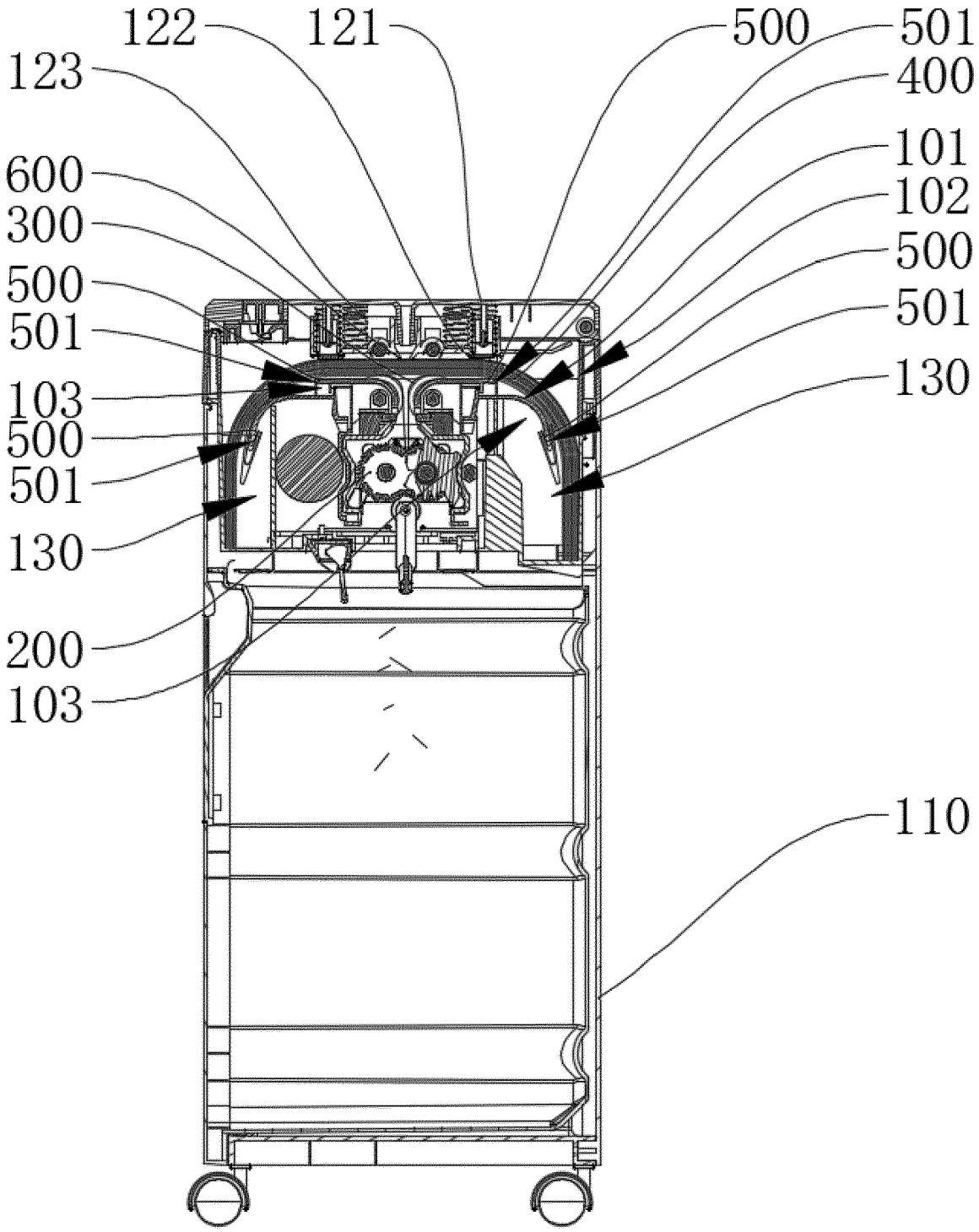
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FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 23 18 8347

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

B02C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 January 2024	Laurim, Jana

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