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### (54) TRANSVERSING MOPPING MECHANISM

(57) The present Invention relates to the technical field of cleaning devices, and in particular to a transversing mopping mechanism, comprising a frame, a power system, a moving component (14), a roller shaft component (31-34), a guide component and a mopping cloth strap (4), wherein the power system, the moving component and the roller shaft component are all arranged on the frame; the roller shaft component comprises transmission roller shafts; guide grooves are formed on the transmission roller shafts, guide strips matched with the guide grooves are arranged on the mopping cloth strap, and guide edge strips corresponding to both ends of the transmission roller shafts are also arranged on the mop-

ping cloth strap; and, the transmission roller shafts drive the mopping cloth strap, and the transmission direction of the mopping cloth strap is perpendicular to the traveling direction of the transversing mopping mechanism. The mopping cloth is arranged transversely, so that the bottom width of the mopping mechanism is covered by the mopping cloth strap, and the mopping mechanism can clean corners. Moreover, by providing the guide grooves, the guide strips, the guide plates and the guide edge strips, the mopping cloth strap is prevented from being dislocated during normal operation, and can be timely restored in place even when being dislocated.

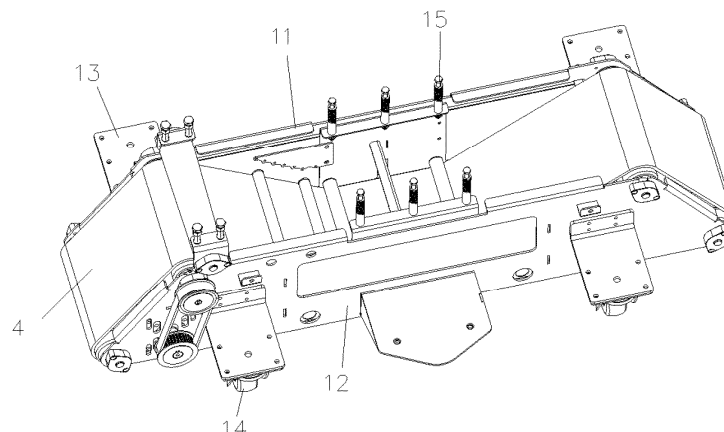


Fig.1

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## Description

### Technical Field of the Invention

[0001] The present Invention relates to the technical field of cleaning devices, and in particular to a transversing mopping mechanism.

### Background of the Invention

[0002] Mopping machines are a kind of devices specially used for cleaning the floor. At present, there are many kinds of mopping machines in the market. One kind of mopping machines is hand-held mopping machines, such as CN201910058458.5, which have higher cleaning power than mops, but are less intelligent. Thus, another kind of intelligent mopping machines has been proposed, which generally mop the floor by using the rotating mopping cloth, such as CN202110709981.7, where the mopping cloth is generally arranged inside the chassis of the mopping machine and thus is difficult to completely clean the corners of the floor, so that the mopping cloth will be attached with dirt after a period of time and needs to be manually detached and cleaned, resulting in inconvenient use and more water consumption in washing the mopping cloth.

[0003] Therefore, it is urgent to innovate the operating principle and matched structure of the mopping machine to obtain a mopping machine capable of cleaning corners, automatically cleaning the mopping cloth and saving more water.

### Summary of the Invention

[0004] In view of the deficiencies in the prior art, an objective of the present Invention is to provide a transversing mopping machine. The transversing means that the transmission direction of the mopping cloth strap is perpendicular to the traveling direction of the mopping mechanism. The mopping cloth is transmitted transversely, so that the bottom width of the mopping mechanism is covered by the mopping cloth strap, and the mopping mechanism can clean corners. Moreover, by providing guide grooves on the transmission roller shafts, providing matched guide strips and guide edge strips on the inner side of the mopping cloth strap and mounting guide plates on the bottom of the frame, the mopping cloth strap is prevented from being dislocated during normal operation and can be timely restored in place even when being dislocated. When the mopping cloth strap on the bottom is attached with dirt, this part of the mopping cloth strap can be transmitted to enter the inside cleaning component for cleaning. The cleaned part of the mopping cloth strap is transmitted to the bottom for continuous mopping, and the cleaning water can be recycled, thus realizing continuous mopping, automatically cleaning the mopping cloth and saving more water.

[0005] To achieve the above objective, the present

Invention provides a transversing mopping mechanism, including a frame, a power system, a moving component, a roller shaft component and a mopping cloth strap, wherein the power system, the moving component and the roller shaft component are all arranged on the frame; the roller shaft component includes transmission roller shafts; guide grooves are formed on the transmission roller shafts, guide strips matched with the guide grooves are arranged on the mopping cloth strap, and guide edge strips corresponding to both ends of the transmission roller shafts are also arranged on the mopping cloth strap; and, the transmission roller shafts drive the mopping cloth strap, and the transmission direction of the mopping cloth strap is perpendicular to the traveling direction of the transversing mopping mechanism.

[0006] The guide groove is a circle of groove formed around the surface of the transmission roller shaft, and the guide strip is a circle of protrusion at the matching position on the inner side of the mopping cloth. During assembling, the guide strip is aligned with and inserted into the guide groove, and the guide edge strips clamp the outer sides of the transmission roller shaft to realize relative fixation. Thus, the mopping cloth strap will not be dislocated when the mopping mechanism operates to advance the mopping cloth strap. Even if the mopping cloth strap is partially dislocated in special cases, the mopping cloth strap can be adjusted in right place.

[0007] Further, the mopping cloth strap is a ring-shaped cloth strip, and the guide strip is arranged on the inner side of the mopping cloth strap.

[0008] Optionally, the width of the mopping cloth strap is the same as that of the transmission roller shaft, and the guide edge strips are arranged on the sides of the mopping cloth strap.

[0009] Optionally, guide plates are mounted on both sides of the bottom of the frame.

[0010] Both sides of the guide plates correspond to the guide strips and the guide edge strips, respectively, to prevent the mopping cloth strap from being dislocated and sliding, thus achieving the guiding effect.

[0011] Further, the transmission roller shafts include a first transmission roller shaft, a second transmission roller shaft, a third transmission roller shaft and a fourth transmission roller shaft; and, the first transmission roller shaft and the second transmission roller shaft are arranged at the upper end of the frame, while the third transmission roller shaft and the fourth transmission roller shaft are arranged at the lower end of the frame.

[0012] Further, the roller shaft component further includes a water squeezing roller shaft; the water squeezing roller shaft is arranged on the outer side of the mopping cloth strap, while the first transmission roller shaft is arranged on the inner side of the mopping cloth strap; a water squeezing zone is arranged on the mopping cloth strap; the water squeezing roller shaft and the first transmission roller shaft correspond to the water squeezing zone of the mopping cloth strap; and, the first transmission roller shaft and the water squeezing roller shaft

squeeze the water squeezing zone of the mopping cloth strap.

[0013] Further, the mopping mechanism further includes a cleaning component, wherein the cleaning component includes a water collecting tank which is arranged below the first transmission roller shaft and the water squeezing roller shaft.

[0014] Further, the cleaning component further includes a first limiting rod and a second limiting rod; both the first limiting rod and the second limiting rod are arranged in the water collecting tank; and, the first limiting rod and the second limiting rod press a part of the mopping cloth strap in the water collecting tank.

[0015] Further, the cleaning component further includes a circulating water pump, a circulating water spray pipe and a clean water spray pipe; the water inlet of the circulating water pump is arranged in the water collecting tank, while the water outlet thereof is connected to the water inlet of the circulating water spray pipe; a spray zone is arranged above the water collecting tank; the spray zone is arranged between the first transmission roller shaft and the second transmission roller shaft; the water outlets of the clean water spray pipe and the circulating water spray pipe correspond to the spray zone of the mopping cloth strap; and, the water collecting tank is extended to the underneath of the spray zone of the mopping cloth strap.

[0016] Further, the cleaning component further includes at least one hairbrush; the hairbrush is arranged in the water collecting tank; a brushing zone is arranged on the mopping cloth strap; the brushing zone is arranged between the first transmission roller shaft and the second transmission roller shaft; the hairbrush corresponds to the brushing zone of the mopping cloth strap; and, the water collecting tank is extended to the underneath of the brushing zone of the mopping cloth strap.

[0017] Further, the cleaning component further includes a filter mesh; the filter mesh is arranged in the water collecting tank, and divides the water collecting tank into a first filter zone and a second filter zone; the first filter zone is arranged above the filter mesh, while the second filter zone is arranged below the filter mesh; and, the water inlet of the circulating water pump is arranged in the second filter zone.

[0018] Further, a sewage discharge port is provided on the bottom of the first filter zone of the water collecting tank. The present Invention has the following beneficial technical effects.

1. By providing guide grooves on the transmission roller shafts, providing guide strips and guide edge strips on the inner side of the mopping cloth strap and mounting guide plates on the bottom of the frame, the mopping cloth strap is prevented from being dislocated during normal operation and can be automatically restored in place even when being dislocated, so that transverse mopping is realized and it is advantageous to mop corners that are difficult to

clean.

2. By using the ring-shaped mopping cloth strap and the transmission roller shafts, after mopping the floor for a period of time, the dirty part of the mopping cloth strap can be transmitted to the cleaning component, and the cleaned part of the mopping cloth strap is transmitted to the bottom of the mopping machine, thus realizing automatic cleaning and continuous mopping.

3. The cleaning component is provided and improved inside the mopping mechanism to recycle the cleaning water, so that it is advantageous to save water and long-time mopping can be realized by adding water once.

### Brief Description of the Drawings

#### [0019]

FIG. 1 is a stereoscopic structure diagram of the transversing mopping mechanism according to the present Invention;

FIG. 2 is a structure diagram of the transversing mopping mechanism according to the present Invention after the mopping cloth strap is removed;

FIG. 3 is a structure diagram of the combination of the mopping cloth strap, the guide plates and the transmission roller shafts in the transversing mopping mechanism according to the present Invention;

FIG. 4 is a structure diagram of the mopping cloth strap of the transversing mopping mechanism according to the present Invention;

FIG. 5 is a front perspective view of the transversing mopping mechanism according to the present Invention after the surface cover is added; and

FIG. 6 is a schematic diagram of the transmission and movement direction of the transversing mopping mechanism according to the present Invention;

in which: 11: first holder; 12: second holder; 13: roller wheel holder; 14: roller wheel; 15: bolt; 16: surface cover; 171: first guide plate; 172: second guide plate; 181: first fixed plate; 182: second fixed plate; 2: power component; 31: first transmission roller shaft; 32: second transmission roller shaft; 33: third transmission roller shaft; 34: fourth transmission roller shaft; 341: first guide groove; 342: second guide groove; 35: water squeezing roller shaft; 36: roller shaft nut; 371: first transmission wheel; 372: second transmission wheel; 373: transmission belt; 4: mopping cloth strap; 41: first guide edge strip; 42: first guide strip; 43: second guide strip; 44: second guide edge

strip; 511: first limiting rod; 512: second limiting rod; 52: water collecting tank; 53: filter mesh; 54: hairbrush; 541: hairbrush head; 55: water pump; 561: first spray pipe; 562: second spray pipe; 57: liquid level meter; a: the transmission direction of the mopping cloth strap; and, b: the traveling direction of the mopping machine.

### Detailed Description of the Invention

**[0020]** The present Invention will be further described below in detail by embodiments with reference to the drawings. The same parts are denoted by the same reference numerals. It should be noted that the word "front", "rear", "left", "right", "upper" or "lower" used in the following description refers to the direction in the drawings, and the word "bottom", "top", "inside" or "outside" refers to the direction toward or away from the geometric center of a particular component.

**[0021]** As shown in FIG. 1, the transversing mopping mechanism of the present Invention includes a first holder 11, a second holder 12, roller wheel holders 13, a moving component and a mopping cloth strap 4. The moving component is roller wheels 14. There are total four roller wheel holders 13, and a roller wheel 14 is provided below each roller wheel holder 13.

**[0022]** The mopping cloth strap 4 is removed to present the internal structure of the transversing mopping mechanism of the present Invention, as shown in FIG. 2, including a power system 2, a roller shaft component and a cleaning component. The power system 2 is composed of a battery and a motor and provides power to the moving component and the roller shaft component. The roller shaft component includes a first transmission roller shaft 31, a second transmission roller shaft 32, a third transmission roller shaft 33, a fourth transmission roller shaft 34, a water squeezing roller shaft 35, roller shaft nuts 36, a first transmission wheel 371, a second transmission wheel 372 and a transmission belt 373. The power system 2 drives the second transmission wheel 372 to rotate and drives the first transmission wheel 371 to rotate through the transmission belt 373. The first transmission wheel 371 is fixed to the first transmission roller shaft 31 so as to drive the first transmission roller shaft 31 to rotate. The second transmission roller shaft 32, the third transmission roller shaft 33 and the fourth transmission roller shaft 34 are all provided with the roller shaft nuts 36, so that they are mounted on the frame and can rotate about their axes. Two guide grooves are formed on each transmission roller shaft. By taking the fourth transmission roller shaft 34 as an example, a first guide groove 341 and a second guide groove 342 are formed on the fourth transmission roller shaft 34.

**[0023]** The cleaning component includes a first limiting rod 511, a second limiting rod 512, a water collecting tank 52, a filter mesh 53, a hairbrush 54, a water pump 55, a first spray pipe 561, a second spray pipe 562 and a liquid level meter 57. The water collecting tank 52 is arranged inside the transversing mopping machine, the filter mesh

53 is arranged in the water collecting tank 52, and the first limiting rod 511, the second limiting rod 512 and the hairbrush 54 are arranged above the filter mesh 53. The bottom of the hairbrush 54 is a hairbrush head 541. The water pump 55 has a water inlet and a water outlet. The water inlet is arranged on the bottom of the water collecting tank 52, while the water outlet is connected to the first spray pipe 561 and the second spray pipe 562. There are spray ports below the first spray pipe 561 and the second spray pipe 562, which can spray water downward. The filter mesh 53 divides the water collecting tank 52 into upper and lower zones. The zone above the filter mesh 53 is called a first filter zone, while the zone below the filter mesh 53 is called a second filter zone. A sewage discharge port is formed on the bottom of the first filter zone, and discharges the dirt on the filter mesh 53 when it is opened.

**[0024]** As shown in FIG. 3, a first guide plate 171 and a second guide plate 172 are provided on both sides of the bottom of the frame, respectively. One side of each of the first guide plate 171 and the second guide plate 172 is close to the third transmission roller shaft 33, while the other side thereof is close to the fourth transmission roller shaft 34. Both the first guide plate 171 and the second guide plate 172 are connected to the first fixed plate 181 and the second fixed plate 182 for fixation and supporting. The first fixed plate 181 is arranged below the second transmission roller shaft 32, and the second fixed plate 182 is arranged below the first transmission roller shaft 31 and the water squeezing roller shaft 35. The first transmission roller shaft 31, the second transmission roller shaft 32, the third transmission roller shaft 33 and the fourth transmission roller shaft 34 are arranged on the inner side of the mopping cloth strap 4, while the water squeezing roller shaft 35 is arranged on the outer side of the mopping cloth strap 4. The first transmission roller shaft 31 and the water squeezing roller shaft 35 clamp the mopping cloth strap 4.

**[0025]** As shown in FIG. 4, the mopping cloth strap 4 is a ring-shaped cloth strip. A first guide strip 42 and a second guide strip 43 are arranged on the inner side of the mopping cloth strap 4, and a first guide edge strip 41 and a second guide edge strip 44 are arranged on the side face thereof. The guide strips are matched with the guide grooves, and the guide edge strips correspond to the side faces of the transmission roller shafts. The guide edge strips also correspond to the guide plates. By taking the fourth transmission roller shaft 34 as an example, the first guide strip 42 is matched with the second guide groove 342, the second guide strip 43 is matched with the first guide groove 341, and the first guide edge strip 41 and the second guide edge strip 44 clamp both sides of the fourth transmission roller shaft 34.

**[0026]** In combination with FIGS. 3 and 4, the first guide plate 171 is clamped by the first guide edge strip 41 and the first guide strip 42, and the second guide plate 172 is clamped by the second guide edge strip 44 and the second guide strip 43, so that the mopping cloth strap

4 is not dislocated, thus achieving the guiding effect.

**[0027]** In combination with FIGS. 1-4, the rear surface of the mopping cloth strap 4 wraps the first transmission roller shaft 31, the second transmission roller shaft 32, the third transmission roller shaft 33 and the fourth transmission roller shaft 34, while the top of the front surface is pressed down by the first limiting rod 511 and the second limiting rod 512. The first spray pipe 561 and the second spray pipe 562 are arranged above the mopping cloth strap 4.

**[0028]** As shown in FIG. 5, a surface cover 16 is fixed on the top by six bolts 15. The top of the liquid level meter 57 is fixed on the surface cover 16, while the bottom thereof is arranged on the bottom of the water collecting tank 52.

**[0029]** The operating principle of the transversing mopping mechanism of the present Invention is given below.

**[0030]** As shown in FIG. 6, the arrow a indicates the transmission direction of the mopping cloth strap, and the arrow b indicates the traveling direction of the mopping mechanism. The two directions are perpendicular to each other, so it is called "transversing". The power system 2 drives the roller wheels 14 to rotate to advance the mopping machine, so as to push the mopping cloth strap 4 on the bottom of the mopping mechanism to rub against the floor, thus realizing the mopping function. The left or right side of the traveling direction can be close to the included angle between the wall and the floor so as to clean corners. Since the mopping cloth strap 4 is provided with guide strips matched with the guide grooves on the transmission roller shafts and also provided with guide edge strips to clamp both sides of the transmission roller shafts and the guide plates, the mopping cloth strap 4 will not be dislocated during normal operation, and can be restored in place even when being dislocated in special cases.

**[0031]** After the mopping mechanism travels for a certain period of time, the mopping cloth strap 4 is dirty, and the power system 2 does not drive the roller wheels 14 and instead drives the first transmission roller shaft 31 to rotate. The mopping cloth strap 4 is transmitted in the direction of arrow a, and the dirty part of the mopping cloth strap 4 enters the water collecting tank 52 and is then cleaned by the cleaning component. Meanwhile, the part of the mopping cloth strap originally in the water collecting tank 52 has been cleaned and transmitted to the bottom for continuous mopping. In the above process, the roller wheels 14 are automatically locked to prevent the side slipping of the mopping mechanism.

**[0032]** The cleaning process of the mopping cloth strap is given below. Firstly, the dirty part of the mopping cloth strap 4 is pressed down after passing through the second limiting rod 512 to come into contact with the hairbrush 541. Along with the transmission, the hairbrush head 541 brushes the surface of the mopping cloth strap 4, and mopping cloth strap 4 then passes through the first limiting rod 511. The power system 2 drives the water pump 55 to operate, and water is sprayed from the first spray

pipe 561 and the second spray pipe 562 to wash the mopping cloth strap 4 for two times. The dirty water flows downward and is filtered by the filter mesh 53. The dirt remains on the filter mesh 53, and the water enters the bottom of the water collecting tank 52. Finally, the mopping cloth strap 4 is clamped by the first transmission roller shaft 31 and the water squeezing roller shaft 35, so that the excessive water is squeezed out to enter the bottom of the water collecting tank 52. So far, the mopping cloth strap 4 has been cleaned. The water on the bottom of the water collecting tank 52 can be recycled. The liquid level meter 57 can detect the liquid level in the water collecting tank 52. When the water level is low, the operation is suspended, and an external water pipe is connected for adding water.

**[0033]** The foregoing description only shows the preferred implementations of the present Invention. The protection scope of the present Invention is not limited to the above embodiments, and all technical solutions under the ideal of the present Invention shall fall into the protection scope of the present Invention. It should be pointed out that, to a person of ordinary skill in the art, some improvements and modifications can be made without departing from the principle of the present Invention, and these improvements and modifications shall be regarded as falling into the protection scope of the present Invention.

## Claims

1. A transversing mopping mechanism, comprising a frame, a power system, a moving component, a roller shaft component and a mopping cloth strap, wherein the power system, the moving component and the roller shaft component are all arranged on the frame; the roller shaft component comprises transmission roller shafts; guide grooves are formed on the transmission roller shafts, guide strips matched with the guide grooves are arranged on the mopping cloth strap, and guide edge strips corresponding to both ends of the transmission roller shafts are also arranged on the mopping cloth strap; and, the transmission roller shafts drive the mopping cloth strap, and the transmission direction of the mopping cloth strap is perpendicular to the traveling direction of the transversing mopping mechanism.
2. The transversing mopping mechanism according to claim 1, wherein the mopping cloth strap is a ring-shaped cloth strip, and the guide strip is arranged on the inner side of the mopping cloth strap.
3. The transversing mopping mechanism according to claim 1, wherein the width of the mopping cloth strap is the same as that of the transmission roller shaft, and the guide edge strips are arranged on the sides of the mopping cloth strap.

4. The transversing mopping mechanism according to claim 1, wherein guide plates are mounted on both sides of the bottom of the frame.
5. The transversing mopping mechanism according to claim 2, wherein the transmission roller shafts comprise a first transmission roller shaft, a second transmission roller shaft, a third transmission roller shaft and a fourth transmission roller shaft; and, the first transmission roller shaft and the second transmission roller shaft are arranged at the upper end of the frame, while the third transmission roller shaft and the fourth transmission roller shaft are arranged at the lower end of the frame.
6. The transversing mopping mechanism according to claim 5, wherein the roller shaft component further comprises a water squeezing roller shaft; the water squeezing roller shaft is arranged on the outer side of the mopping cloth strap, while the first transmission roller shaft is arranged on the inner side of the mopping cloth strap; a water squeezing zone is arranged on the mopping cloth strap; the water squeezing roller shaft and the first transmission roller shaft correspond to the water squeezing zone of the mopping cloth strap; and, the first transmission roller shaft and the water squeezing roller shaft squeeze the water squeezing zone of the mopping cloth strap.
7. The transversing mopping mechanism according to claim 6, further comprising a cleaning component, wherein the cleaning component comprises a water collecting tank which is arranged below the first transmission roller shaft and the water squeezing roller shaft.
8. The transversing mopping mechanism according to claim 7, wherein the cleaning component further comprises a first limiting rod and a second limiting rod; both the first limiting rod and the second limiting rod are arranged in the water collecting tank; and, the first limiting rod and the second limiting rod press a part of the mopping cloth strap in the water collecting tank.
9. The transversing mopping mechanism according to claim 8, wherein the cleaning component further comprises a circulating water pump, a circulating water spray pipe and a clean water spray pipe; the water inlet of the circulating water pump is arranged in the water collecting tank, while the water outlet thereof is connected to the water inlet of the circulating water spray pipe; a spray zone is arranged above the water collecting tank; the spray zone is arranged between the first transmission roller shaft and the second transmission roller shaft; the water outlets of the clean water spray pipe and the circulating water spray pipe correspond to the spray zone of the mopping cloth strap; and, the water collecting tank is extended to the underneath of the spray zone of the mopping cloth strap.
10. The transversing mopping mechanism according to claim 9, wherein the cleaning component further comprises at least one hairbrush; the hairbrush is arranged in the water collecting tank; a brushing zone is arranged on the mopping cloth strap; the brushing zone is arranged between the first transmission roller shaft and the second transmission roller shaft; the hairbrush corresponds to the brushing zone of the mopping cloth strap; and, the water collecting tank is extended to the underneath of the brushing zone of the mopping cloth strap.
11. The transversing mopping mechanism according to claim 10, wherein the cleaning component further comprises a filter mesh; the filter mesh is arranged in the water collecting tank, and divides the water collecting tank into a first filter zone and a second filter zone; the first filter zone is arranged above the filter mesh, while the second filter zone is arranged below the filter mesh; and, the water inlet of the circulating water pump is arranged in the second filter zone.
12. The transversing mopping mechanism according to claim 11, wherein a sewage discharge port is provided on the bottom of the first filter zone of the water collecting tank.

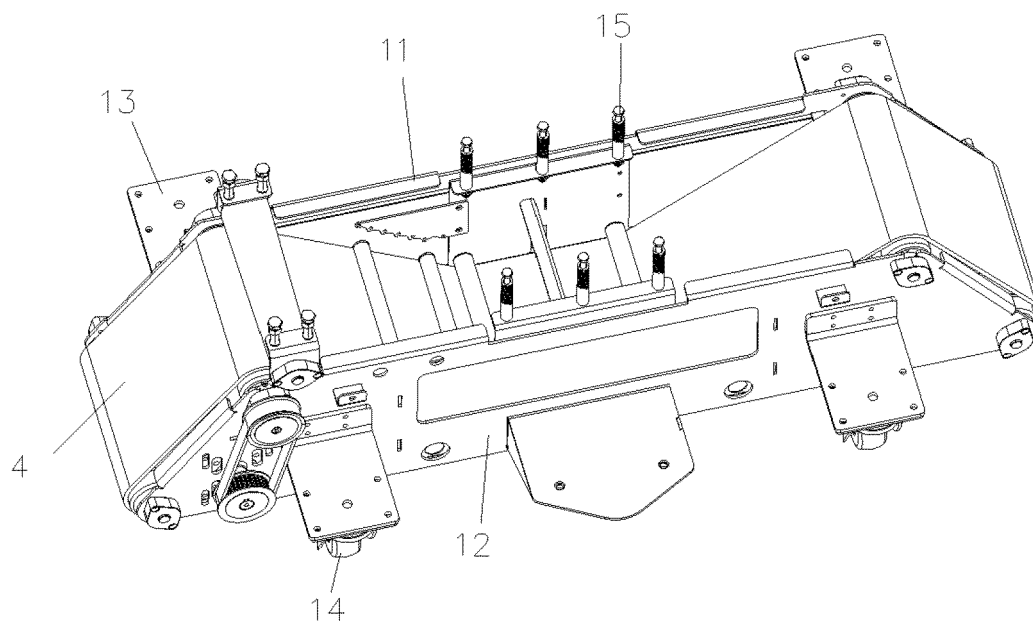


Fig.1

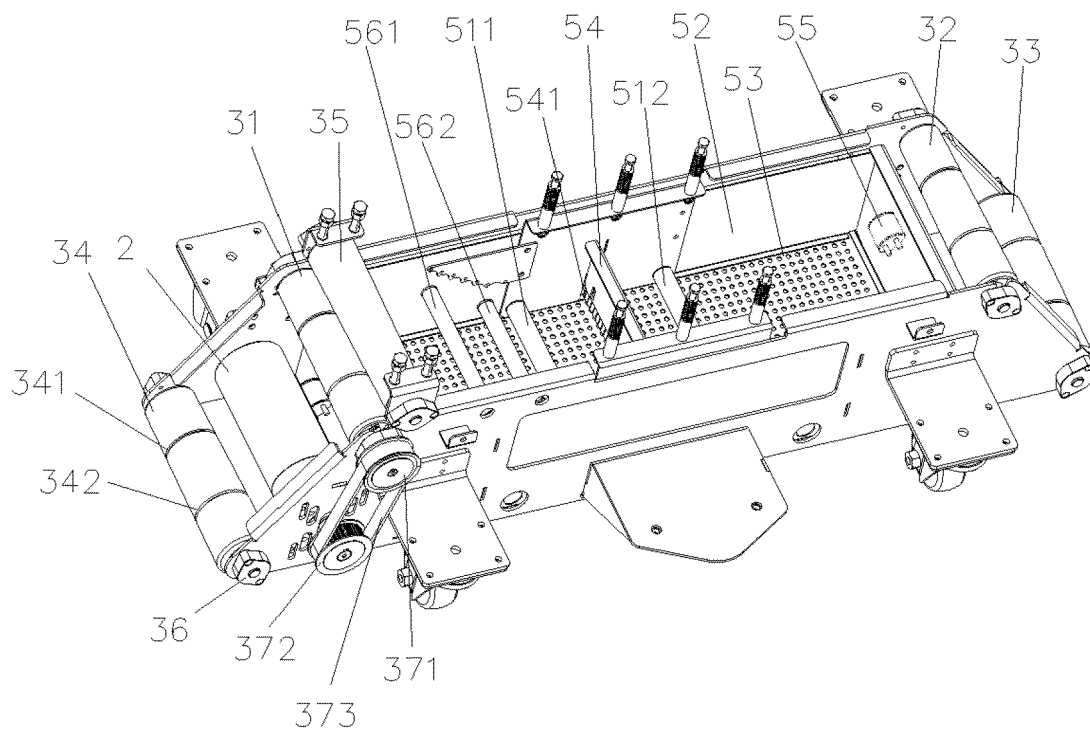


Fig.2

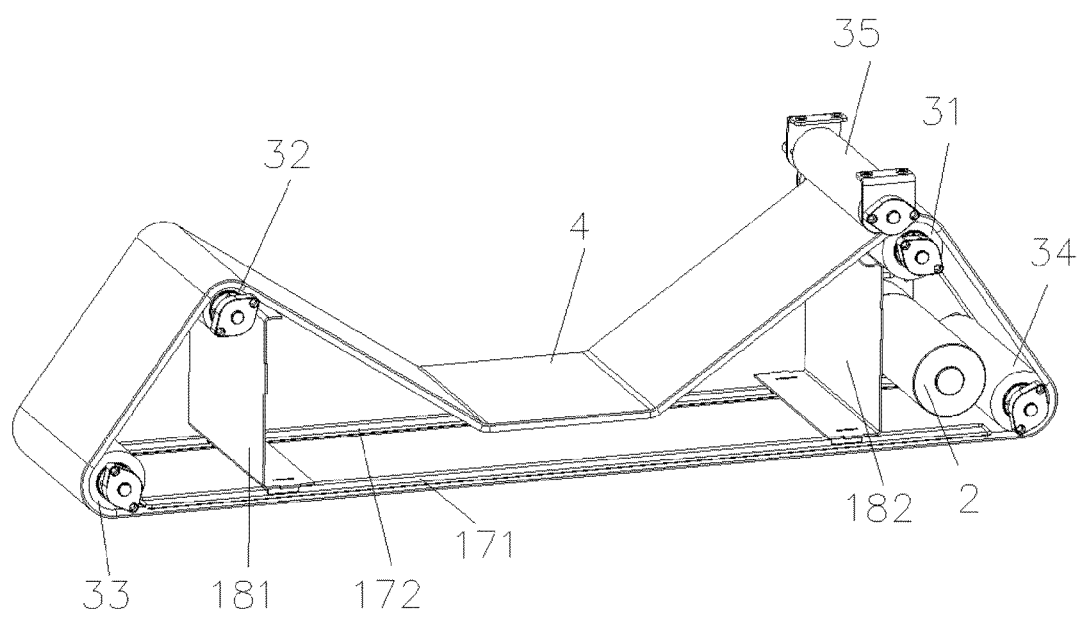


Fig.3

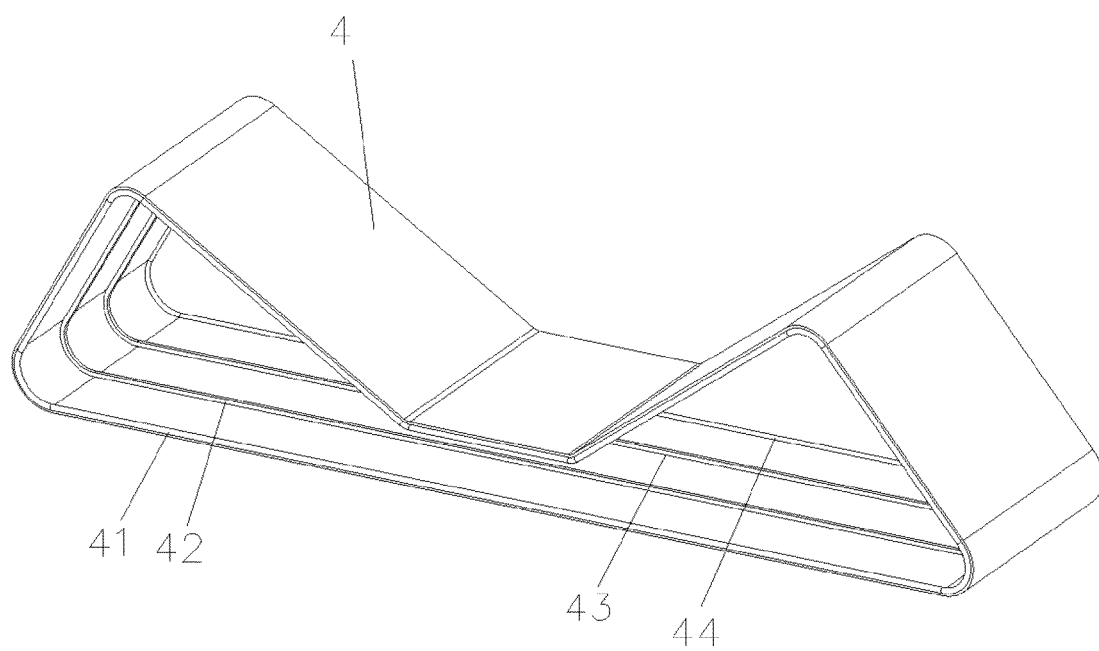


Fig.4

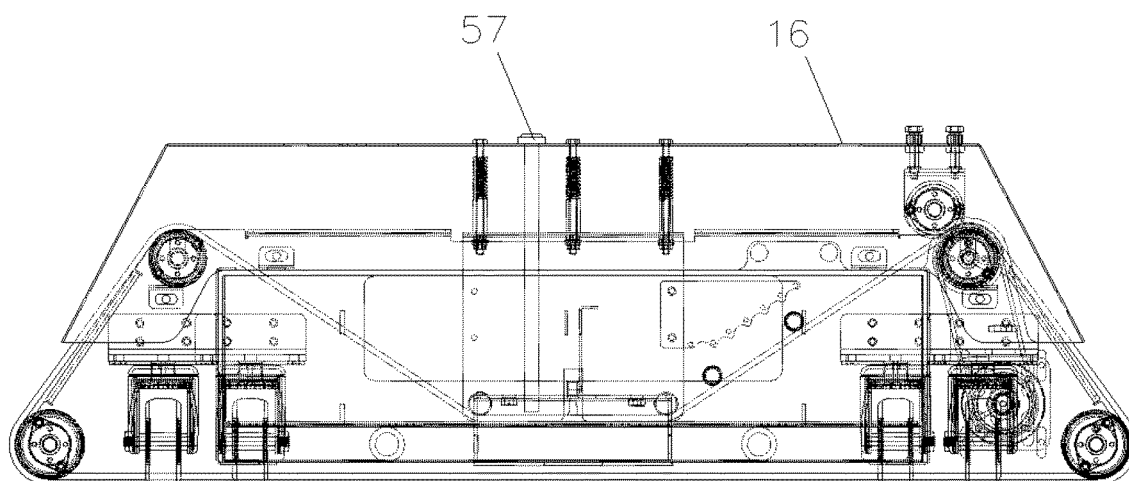


Fig.5

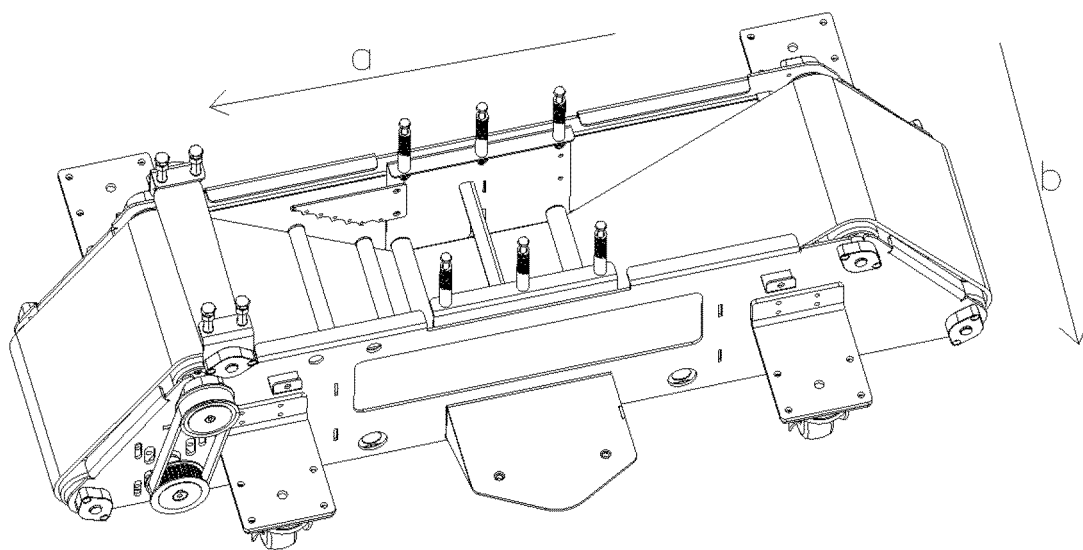


Fig.6



## EUROPEAN SEARCH REPORT

Application Number

EP 25 20 9307

## DOCUMENTS CONSIDERED TO BE RELEVANT

| 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)         |
|                                                                                                                                                                                                                                                                              |                                                                                              |                                  | A47L                                    |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                   |                                                                                              |                                  |                                         |
| Place of search                                                                                                                                                                                                                                                              |                                                                                              | Date of completion of the search | Examiner                                |
| Munich                                                                                                                                                                                                                                                                       |                                                                                              | 10 March 2026                    | Jezierski, Krzysztof                    |
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**REFERENCES CITED IN THE DESCRIPTION**

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