

Automatic Sticker Application Apparatus

Technical Field of the Invention

The Automatic Sticker Application Apparatus is an invention, which relates to the application a long advertising printed sticker to the handrails of escalators and moving sidewalks.

Background Of the Invention

This type of apparatus is similar to official entry 2002-537200

Summary of the Invention

This apparatus is able to uniformly apply a sticker with printed advertising onto the handrail of an escalator

This invention is proposed in order to solve a problem that conventional technology has, and the Automatic Sticker Application Apparatus, which can stick a printed sticker onto the surface of a moving handrail uniformly, is the offered solution.

In order to attain this purpose, the automatic sticker application apparatus is designed as follows:

The printed sticker is sent out from the supply winder which is attached to the side plate which is used as a base.

The printed sticker is sent from the supply winder to the separation rollers which separate the printed sticker from the peel-away paper, and are attached to the above mentioned side plate.

The friction board powers the above mentioned supply winder, and the collection winder. The collection winder collects the separated peel-away paper from the above, mentioned separation rollers. The collection winder is also attached to the above mentioned side plate

Also attached to the above side plate is the press roller, which sticks the separated printed sticker that comes from the above-mentioned separation rollers onto the surface of the moving handrail.

The brush group which firmly sticks both the edges of the printed sticker onto the sides of the moving handrail, is installed in the front part of the above-mentioned side plate

The entire apparatus rests on the moving handrail, supported by support rollers attached to the front and back of the above-mentioned side plates at right angles via support plates. The entire apparatus is secured to the escalator under the handrail on the handrail guidance rail by stabilizing screw clamps attached to the front and back of the side plate, and hold the apparatus in place.

The Automatic Sticker Application Apparatus of claim 1 has a centering system. A guidance rod is attached horizontally to the back of a fixed plate which is attached to the above mentioned side plate. Centering guides are attached to both sides of the guidance rod on both sides of the moving handrail. The centering guides have rollers that roll

along the sides of the moving handrail. The guidance rod has stop screws which adjust and fix the centering guides.

Brief explanation of the drawings

Fig. 1 is the side view showing 1 enforcement form of the automatic sticker application apparatus by this invention.

Fig. 2 is the plane view of the above-mentioned automatic sticker application apparatus.

Fig. 3 is the top view of the above-mentioned automatic sticker application apparatus.

Fig. 4 is the rear elevation of the above-mentioned automatic sticker application apparatus.

Fig. 5 is the rear elevation showing a separation roller.

Fig. 6 is the rear elevation showing a support roller.

Fig. 7 is the plane view showing a press roller.

Fig. 8 is the top view of Fig. 7.

Fig. 9 is the plane view showing the escalator stuck on the move handrail.

Fig. 10 is the A-A line sectional view of Fig. 9.

Fig. 11 is the side view of the automatic sticker application apparatus in another form of operation.

Fig.12 is the plan of the automatic sticker application apparatus in another in another form of operation.

Fig.13 is the front view of the automatic sticker application apparatus in another form of operation.

Explanation of Reference Numerals

- | | |
|-------|------------------------|
| 1 | Side plate |
| 2 | Spacer |
| 3 | auxiliary side plate 3 |
| 4 | supply winder |
| 5 | axis of rotation |
| 6 | gear |
| 7 | guide-plate |
| 8 | bearing |
| 9 | gear |
| 10 | the friction disc |
| 11 | gear |
| 12 | collection winder |
| 13 | axis of rotation |
| 14,15 | bearing |
| 16 | gear |
| 17 | the small gear |
| 18 | printed sticker |
| 19 | peel-away paper |
| 20 | the separation rollers |
| 21 | separation rollers |
| 22 | stop pin |
| 23 | item |

24	bearings
25	press roller
26	pivot
27	arm
28	pressure adjustment screw
29	moving handrail
30	brush
31	fixed plate
32	brush attachment arm
33	pivot
34	stop screw
35	brush
36	brush installation plate
37	height adjustment screw
38,39,40	brush groups
41	fixed plate
42,43	support roller
44,45	support plate
46	handrail guidance rail
47,48	screw clamp
49,50	item
51	connector
52	arm
53	putt
54	step of the escalator
55	arm
56	pressure adjustment screw
57	rubber piece
58	guidance rod
59	centering guides
60	rollers
61	stop screws
62	protective cover

Mode/embodiments of the invention

Hereafter, the form of implementation of this invention is explained in detail from drawings.

Figure 1, shows the side view of the Automatic Sticker Application Apparatus. Figure 2 shows the plane view. Figure 3 shows the front view, and figure 4 shows the rear view.

In these figures, the auxiliary side plate 3 is attached to the base serving side plate 1 through spacers 2. The supply winder axis of rotation 5 is supported by bearings 6, installed in the side plate 1. The brim or guard of the supply winder 4 is shown by 7. Outside the side plate 1, gear 9 is attached to the outside portion of the supply winder

axis of rotation, and is supported by bearing 8, which is installed in the auxiliary side plate 3. This gear 9 engages gear 11 of the friction disc 10

The axis of rotation 13 of the collection winder 12 is attached in the side plate 1 and the auxiliary side plate 3, and is supported by bearings 14 and 15, which are installed in the side plate and auxiliary side plate respectively. A one-way clutch is built into the collection winder 12. Moreover, by way of the friction disc 10 gear 16 engages the small gear 17, which is attached to the collection winder axis of rotation 13. Therefore, rotation of the supply winder 4 transfers motion to the friction board 10, which is then transmitted to gear 16, which in turn engages gear 17, which then powers the collection winder 12.

The underside of the printed sticker 18 is an adhesive layer, covered with peel-away paper 19 when it leaves the supply winder 4. The separation rollers 20 and 21 are attached in the lower part of the side plate 1 and separate the printed sticker 18 from the peel-away paper 19. These separation rollers are shown in Figure. 5 and rotate freely on their axes. The stop pin 22 attaches the starting edge of the separated peel-away paper 19 to the collection winder 12 so it can be wound. In Figure 1, item 23 is attached to the side of the collection winder 12 to lock the fixing pin 22.

Figure 7 shows the pivot 26 extends from the side plate 1 and acts as a fulcrum. Press roller 25 is supported by bearings 24 and rotates freely on its axis. The press roller is attached to arms 27, which extend from the pivot 26. The pressure adjustment screw 28 shown in Figure 8 is attached at the opposite end of arms 27. By turning the pressure adjustment screw 28, we can adjust how strongly the press roller 25 sticks the printed sticker 18 to the moving handrail 29. Brush 30 is attached to the bottom of arms 27 before the pressure adjustment screw 28. Brush 30 further pushes the printed sticker 18 onto the moving handrail 29.

Fixed plate 31 is attached at a right angle to side plate 1. Pivot 33 is attached to the fixed plate 31. The brush attachment arm 32 is attached to the pivot 33 and forms a right angle with the front face of the fixed plate 31. The arm 32 can rotate on the pivot 33. 34 denotes the fixed screw. Brush 35 is attached to the bottom of arm 32. The brush 35 pushes and further sticks the sides of the printed sticker 18 onto the top of the rounded corners of the moving handrail 29.

The brush installation plate 36 is installed at the front of arm 32 so that the brush installation plate 36 can be put on and cover both sides of the moving handrail. The brush attachment plate 36 can be adjusted to the height of the moving handrail 29 by turning the height adjustment screw 37. Inside the brush attachment plate 36 on both sides, the brush groups 38, 39, and 40 are attached so that both the edges of the printed sticker 18 can be gradually and progressively stuck down both sides the moving handrail 29, until it is securely fastened.

Fixed plate 41 is attached at the back of side plate 1 at a right angle. Support roller 42 is

attached to fixed plate 41 and support roller 43 is attached to the fixed plate 31. Support rollers 42 and 43 support the entire apparatus and rest on top of the moving escalator 29. In figure 6 diagrams support rollers 42 and 43 attached to support plates 44 and 45.

From Figures. 3 and 4, stabilizing screw clamps 47 and 48 are screwed through fixed plates 41 and 31 respectively. Stabilizing screw clamps pinch the handrail guidance rail 46 from both sides, and secure the apparatus to the escalator, preventing it from moving. securing tips 49 and 50 are at the end of the stabilizing screw clamps 47, 48 and that pinch the escalator handrail guidance rail 46. Connector 51 attaches arm 52 to side plate 1. Putt 53 is attached to arm 52. Putt 53 further stabilizes the entire apparatus on the escalator. Arm 52 and 53 are support/stabilizing structures.

The following will explain the operation of the Automatic Sticker Application Apparatus.

First, the printed sticker 18 with its adhesive underside covered with peel-away paper 19, is sent out from supply winder 4, and the printed sticker 18 and the peel-away paper 19 are separated by the separation rollers 20 and 21. The collection winder 12 collects the separated peel-away paper 19.

The printed sticker 18 is stuck to the surface of the moving handrail 29 by press roller 25. In figure 1, the moving handrail 29 is moving to the right. As the supply winder 4 continuously sends out the printed sticker 18, it transfers motion to the friction disc 10, which in turn transfers motion to the collection winder 12, which collects the separated peel-away paper 19.

Brush 35 pushes the sides of the printed sticker 18 further onto the moving handrail 29 so that the sticker 18 is slightly bent at the rounded corners of the moving handrail. Then, brushes 38, 39 and 40 press and fix the printed sticker 18 onto the sides of the moving handrail 29. The printed sticker 18 is fixed onto the surface of the moving handrail 29 as shown in figures 9 and 10. Figure 9 also shows the step of the escalator 54. Figure 10 also shows the printed sticker 18 covering the surface of a moving handrail 29. Because the printed sticker 18 edges reach around the sides and near the bottom of the moving handrail 29, it acts as preventive measure to unwanted removal as it is difficult for fingers to reach in and pull the edges of printed sticker 18 off from their placement.

Below, other functions of the Automatic Sticker Application Apparatus will be explained based on Figures. 11 and 13.

Arm 55 is L shaped and can rotate on pivot 26. The press roller 25 is at the back end of the arm 55, and the front end has the pressure adjustment screw 56.

The pressure at which press roller 25 presses the printed sticker 18 onto the moving handrail 29 can be adjusted by turning the pressure adjustment screw 56. The rubber piece 57 is between the pivot 26 and press roller 25, and runs along on top of the printed

sticker 18 as it leaves the press roller 25.

Guidance rod 58 is attached to the back of fixed plate 41 horizontally. Centering guides 59 are attached to both sides of guidance rod 58 on either side of the moving handrail 29. Centering guides 59 have rollers 60 that roll along the sides of the moving handrail 29. Guidance rod 58 has stop screws 61 which adjust and fix the centering guides 59.

The following explains the operation of the centering system.

The centering guides 59 on either side are adjusted and then fixed by stop screws 61 so that the printed sticker 18 pulled out from the separation rollers 20 and 21 is located at the center of the moving handrail 29. Stabilizing screw clamps 47 and 48 are then tightened, fixing the entire apparatus to the escalator. Cover 62 covers and protects the gears.

Effects of the Invention

As mentioned above, the press roller fixes the printed sticker to the moving handrail's surface. Brushes then fix the printed sticker to the sides of the handrail. This invention is able to effectively apply printed sticker to a moving handrail.

The apparatus rests on two support rollers, one located at each end of the apparatus. The apparatus also has two pairs of stabilizing screw clamps at the front and back, which clamp onto the escalator guide rail. Consequently, the apparatus stabilizes itself and fixes the printed sticker onto the moving handrail at the same uniform pressure.

The centering guides ensure that the application of the printed sticker is centered on the moving handrail.

Claims

1. Automatic sticker application apparatus, characterized that advertising is printed on a roll of adhesive film, becoming a printed sticker. The underside of the sticker is an adhesive layer, which is covered with peel-away paper. The printed sticker is sent out from the supply winder, which is attached to the side plate, which is used as a base.

The printed sticker is sent from the supply winder to the separation rollers, which separate the printed sticker from the peel-away paper. The separation rollers are attached to the above mentioned side plate.

The friction board powers the above mentioned supply winder, and the collection winder. The collection winder collects the separated peel-away paper from the above-mentioned separation rollers. The collection winder is also attached to the above mentioned side plate

Also attached to the above-mentioned side plate is the press roller, which sticks the separated printed sticker that comes from the above-mentioned separation rollers onto the surface of the moving handrail.

The brush group which firmly sticks both the edges of the sticker onto the sides of the moving handrail, is installed in the front part of the above-mentioned side plate

The entire apparatus rests on the moving handrail, supported by support rollers attached to the front and back of the above-mentioned side plates at right angles via support plates. The entire apparatus is secured to the escalator under the handrail on the handrail guidance rail by stabilizing screw clamps attached to the front and back of the side plate, which hold the apparatus in place.

2. The automatic aticker application apparatus of claim 1 has a centering system. A guidance rod is attached horizontally to the back of a fixed plate which is attached to the above mentioned side plate. Centering guides are attached to both sides of the guidance rod on both sides of the moving handrail. The centering guides have rollers that roll along the sides of the moving handrail. The guidance rod has stop screws which adjust and fix the centering guides.