PAPER FEEDING TRAY DUST-PROOF COVER

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a dust-proof cover used for the paper feeding tray of an image recording apparatus such as facsimile apparatus.

Description of the Related Art

Image recording apparatuses such as facsimile apparatuses are conventionally provided with a paper feeding tray that supplies recording paper to the inside of the apparatus. An example of facsimile apparatus with a paper-feeding tray is shown in FIG.1.

In FIG.1, receiver holding section 3 is provided at the left from the viewer's viewpoint of the principal plane of main unit 1 and receiver 2 is placed on receiver holding section 3. Operation panel 4 is provided from the center to the right from the viewer's viewpoint of main unit 1. Facsimile transmission/reception buttons are formed on this operation panel 4.

The front side of main unit 1 is provided with detachable portable hand scanner 5. Furthermore, on the back side of main unit 1 is paper feeding tray 6 with paper mounting plane 7 facing upward. This paper feeding tray 6 is attached to main unit 1 in such a way that its

surface forms a prescribed angle with the principal plane of main unit 1.

On the tip side of paper feeding tray 6 is extensible auxiliary try 8 to support the portion of recording paper sticking out of the tip side of paper feeding tray 6. When recording paper is placed on mounting plane 7 of paper feeding tray 6, this auxiliary try 8 is used drawn out in the arrow direction.

However, in such a conventional paper feeding tray, recording paper placed on mounting plane 7 of paper feeding tray 6 remains exposed. If paper is left exposed in this way, dust and dirt may be stuck to paper. Particularly, static electricity generated by friction when feeding recording paper staked on the paper feeding tray is likely to cause dust and dirt to be stuck to recording paper.

SUMMARY OF THE INVENTION

An objective of the present invention is to provide a paper feeding tray dust-proof cover that will prevent dust or dirt from sticking to recording paper and an image recording apparatus provided therewith.

The present invention achieves the objective above by providing a paper feeding tray dust-proof cover with at least a flat cover body which covers the recording paper mounting side of the paper feeding tray and a latch

section on this cover body which allows flexible engagement with the latch protrusion formed on said paper feeding tray.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 illustrates a diagonally projected drawing of a conventional facsimile apparatus;

FIG.2 illustrates a diagonally projected drawing of a facsimile apparatus which is the image recording apparatus according to a first embodiment of the present invention;

FIG.3 illustrates a diagonally projected drawing showing a paper feeding tray dust-proof cover attached to the paper feeding tray in the facsimile apparatus according to the embodiment above;

FIG.4A, FIG.4B and FIG.4C illustrate a diagonally projected drawing showing the process of attaching the dust-proof cover to the paper feeding tray of the facsimile apparatus according to the embodiment above; and

FIG.5A, FIG.5B and FIG.5C illustrate a top view showing the process of attaching the dust-proof cover to the paper feeding tray of the facsimile apparatus according to the embodiment above.

DETAILED DESCRIPTION OF THE

PREFERRED EMBODIMENT

With reference now to the attached drawings, the embodiment of the present invention is explained in detail below.

FIG.2 illustrates a diagonally projected drawing showing a facsimile apparatus which is the image recording apparatus according to a first embodiment of the present invention. Main unit 10 in FIG.2 incorporates a facsimile unit that outputs transmitted data and reads documents and transmits them as data. Main unit 10 also has a principal plane which has an inclination of a prescribed angle from the horizontal plane.

Receiver holding section 12 is provided at the left from the viewer's viewpoint of main unit 10. A cavity is formed on receiver holding section 12 to allow the speaker of receiver 11 to be mounted. Operation panel 13 is provided from the center to the right from the viewer's viewpoint of the principal plane of main unit 10.

This operation panel 13 is provided with various buttons and dials to operate the facsimile apparatus. For example, operation panel 13 comprises answering recording button 14 that commands answering recording or replay of answering recording, display 15 that displays various data such as telephone numbers and names, 10-key pad 16 to enter telephone numbers or other numbers,

copy button 17 to command a copy of a document, start button to start transmission, scroll dial 19 to scroll preset telephone numbers, stop button 20 to stop operation, etc.

On the forefront of main unit 10 is scanner 21 that scans the image of a document. This scanner 21 is detachable from main unit 10 so that it may be used as a handy scanner by removing it from main unit 10. On the side of main unit 10 is antenna 22 that is axially fixed in a rotatable manner.

On the back of main unit 10 is paper feeding tray 23. This paper feeding tray 23 is attached to the document feeding opening provided on the back of main unit 10 in a rotatable manner. A support for the paper feeding tray is provided near the document feeding opening which is designed to stop rotation of paper feeding tray 23 when the inclination of recording paper mounting plane 24 with respect to the horizontal plane reaches a prescribed angle.

Recording paper guide 23a is provided on paper feeding tray 23 on the main unit side. This recording paper guide 23a covers recording paper mounting plane 24 of paper feeding tray 23 and guides recording paper to the document feeding opening of main unit 10.

Furthermore, at both sides of paper feeding tray 23 is brim 23b that flanks recording paper mounting plane 24 almost at a right angle. On the outer surface of this

brim 23b, latch protrusion 31 is formed which fits in the latch hole of a dust-proof cover which will be described later. This latch protrusion 31 is provided on both sides at symmetrical positions with respect to the center line of paper feeding tray 23. As seen in FIG.5A, latch protrusion 31 has a quasi trapezoidal form with a slope along the longitudinal direction of brim 23b. It is desirable that latch protrusion 31 be located at a position at which, when dust-proof cover 25 which will be described later is attached, the surface of paper feeding tray 23 is virtually flush with the surface of dust-proof cover 25.

FIG.3 illustrates a diagonally projected drawing showing the dust-proof cover attached to the paper feeding tray in the facsimile apparatus above.

Dust-proof cover 25 attached to paper feeding tray 23 is of a quasi rectangle hood type with one closed end and the other open end and has a flat form whose width and length are sufficiently long compared to its thickness. This dust-proof cover 25 is attached in such a way that the paper feeding tray is covered, starting with its tip side (the side opposite to the main unit) with the open end side of the dust-proof cover. In this case, the surface of paper feeding tray 23 is almost flush with the surface of dust-proof cover 25.

This dust-proof cover 25 is a little wider than paper feeding tray 23 and has at least a length enough

to cover recording paper mounting plane 24 of paper feeding tray 23. Therefore, it is so structured that the tip of recording paper guide 23a of paper feeding tray 23 overlaps the opening of dust-proof cover 25. This prevents dust or dirt from entering the inside of paper feeding tray 23 while dust-proof cover 25 is attached.

While dust-proof cover 25 is attached to paper feeding tray 23, the closed side of dust-proof cover 25 covers the tip of the recording paper placed in paper feeding tray 23, that is, the drooping free end without being supported by paper feeding tray 23. This allows the entire recording paper placed on paper feeding tray 23 to be supported almost parallel to recording paper mounting plane 24, making it possible to smoothly feed recording paper to main unit 10.

On the side of dust-proof cover 25 is latch hole 32 which engages with latch protrusion 31 provided on paper feeding tray 23. This latch hole 32 is provided on both sides of dust-proof cover 25 at virtually symmetrical positions, having a size enough to allow whole latch protrusion 31 to fit in.

It is desirable that dust-proof cover 25 have the area on the opening side including at least latch hole 32 made of a flexible material. When dust-proof cover 25 is attached to paper feeding tray 23, this allows latch protrusion 31 of paper feeding tray 23 to push up the area including latch hole 32 then enabling latch

protrusion 31 to fit in latch hole 32. Thus, it is possible to easily and smoothly attach dust-proof cover 25 to paper feeding tray 23. The present embodiment uses a flexible material for entire dust-proof cover 25.

Furthermore, use of a transparent or semi-transparent material for dust-proof cover 25 makes it possible to check recording paper inside dust-proof cover 25 to grasp the amount of remaining recording paper on the paper feeding tray.

Then, the operation when attaching dust-proof cover 25 of the present invention to paper feeding tray 23 is explained below. FIG.4A illustrates a diagonally projected drawing showing the state prior to attaching the dust-proof cover to the paper feeding tray of the facsimile apparatus; FIG.4B, a diagonally projected drawing showing the state while attaching the dust-proof cover to the paper feeding tray of the facsimile apparatus; and FIG.4C, a diagonally projected drawing showing the state after the dust-proof cover has been attached to the paper feeding tray of the facsimile apparatus. FIG.5A illustrates a top view showing the state prior to attaching the dust-proof cover to the paper feeding tray of the facsimile apparatus; FIG.5B; a top view showing the state while attaching the dust-proof cover to the paper feeding tray of the facsimile apparatus; and FIG.5C, a top view showing the state after the dust-proof cover has been attached to

the paper feeding tray of the facsimile apparatus.

When the opening side of dust-proof cover 25 is fit into the tip side of paper feeding tray 23, sliding dust-proof cover 25 along paper feeding tray 23 in the arrow direction, protruded section 25a provided at the tip of the opening side of dust-proof cover 25 comes closer to recording paper guide 23a of paper feeding tray 23 as shown if FIG.4A and FIG.5A. At the same time, the tip of skirt section 33 which is an area ahead of latch hole 32 of dust-proof cover 25 comes closer to latch protrusion 31 of paper feeding tray 23.

Then, if dust-proof cover 25 is further slid along paper feeding tray 23 in the arrow direction, skirt section 33 of dust-proof cover 25 touches the slope of the tip side of latch protrusion 31 of paper feeding tray 23 and FIG.5B and skirt section 33 moves along the slope as shown in FIG.4B. In this case, since dust-proof cover 25 is made of a flexible material, the skirt section is pushed up and deformed by latch protrusion 31.

Then, if dust-proof cover 25 is further slid along paper feeding tray 23 in the arrow direction, deformed skirt section 33 recovers its original form and latch protrusion 31 of paper feeding tray 23 fits into latch hole 32 of dust-proof cover 25. Protruded section 25a of dust-proof cover 25 goes into guide 23 of paper feeding tray 23. In this way, recording paper in paper feeding tray 23 is not exposed and thus kept free of dust and

dirt.

When dust-proof cover 25 is removed from paper feeding tray 23, the inside of latch hole 32 of dust-proof cover 25 on the main unit side touches the slope of latch protrusion 31 of paper feeding tray 23 and skirt section 33 moves along the slope. Dust-proof cover 25 is then pushed up and deformed by latch protrusion 31. Then, deformed skirt section 33 recovers its original form and dust-proof cover 25 removes from paper feeding tray 23.

In this way, the formation of a taper on latch protrusion 31 of paper feeding tray 23 allows smooth attachment/detachment of dust-proof cover 25.

In the embodiment above, the latch protrusion is made of a rigid material and the dust-proof cover is made of a flexible material, but it is also possible to configure the present invention in such a way that the latch protrusion is depressed inside the paper feeding tray, with the dust-proof cover made of a rigid material.

In the embodiment above, the latch protrusion with a slope is provided on both sides along the dust-proof cover attachment/detachment direction, but the present invention is also applicable to the case where the latch protrusion with a slope is provided only on one side along the dust-proof cover attachment/detachment direction.

In the embodiment above, a hood type dust-proof cover with one closed end and the other open end is used, but the present invention is also applicable to any form

of dust-proof cover that can cover at least the recording paper mounting side of the paper feeding tray even if it is not of a hood type.

In the above embodiment, the image recording apparatus is a facsimile apparatus, but the present invention is also applicable to any image recording apparatus such as copier and printer.

As explained above, since the paper feeding tray dust-proof cover is at least equipped with the flat cover body that covers the recording paper mounting side of the paper feeding tray and the latch section provided on the cover flexible to the latch protrusion formed on said paper feeding tray, it can prevent dust and dirt from sticking to recording paper even if recording paper is left on the paper feeding tray.

Furthermore, equipped with said dust-proof cover, the image recording apparatus of the present invention can feed recording paper to the inside of the apparatus without dust and dirt sticking to recording paper even if recording paper is left on the paper feeding tray.

What is claimed is:

1. A paper feeding tray dust-proof cover, comprising:

a flat cover body that covers at least the recording paper mounting side of the paper feeding tray; and

a latch section provided on the cover body that is flexible to a latch protrusion formed on said paper feeding tray.

2. The paper feeding tray dust-proof cover according to claim 1, wherein:

when attached to the paper feeding tray, the cover body covers the free end side of recording paper placed on said paper feeding tray.

3. The paper feeding tray dust-proof cover according to claim 1, wherein:

the area including the latch section of the cover body has a flexible structure.

4. An image recording apparatus, comprising:

a main unit equipped with an image recording unit;

a paper feeding tray attached to said main unit that holds recording paper; and

the paper feeding tray dust-proof cover according to claim 1.