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(54) Ink mist collector with porous bottom

(57) An ink mist collector assembly collects ink mist formed on a printhead of an ink jet printing system. The ink mist collector assembly comprises a magnetic material, and a porous material attached to the magnetic material to create a porous magnetic unit. The ink mist collector assembly further comprises means for engaging the porous magnetic unit to the printhead, to collect ink mist formed on the printhead.

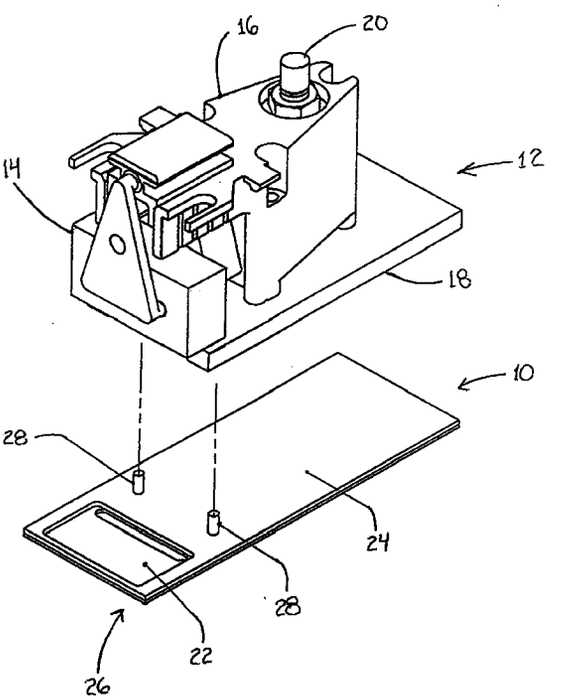


FIGURE 1

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Description

Technical Field

The present invention relates to continuous ink jet printers and, more particularly, to an apparatus for the collection of ink mist associated with continuous flow ink jet printheads.

Background Art

Ink jet printing systems are known in which a printhead defines one or more rows of orifices which receive an electrically conductive recording fluid from a pressurized fluid supply manifold and eject the fluid in rows of parallel streams. Printers using such printheads accomplish graphic reproduction by selectively charging and deflecting the drops in each of the streams and depositing at least some of the drops on a print receiving medium, while others of the drops strike a drop catcher device.

Ink jet printheads have a wicking apparatus on the surface parallel to the image substrate to collect drops of ink and mist. This ensures that no ink will form on the bottom of a printhead and drip onto the substrate surface.

Previous attempts to prevent the ink mist and drops that form on the bottom of a printhead from dripping onto the substrate surface employ a porous material. Unfortunately, this porous material is not well located to the printhead. Prior art on holding the porous plate in desired relation to the printhead involves registering the plate to a housing, not to the printhead. This arrangement is not ideal because allowance must be made for clearance, tolerance "stack-up", and registration.

Existing mist collectors are comprised of multiple layers of metal to hold, locate and fasten the porous plate in place, usually via screws, to a housing situated around the printhead. The multiple layers have the undesirable effect of increasing the distance between the printhead and the substrate. Furthermore, since the porous plate is attached to the housing using sheets of metal and a screw, a tool is required to remove and clean the plate, taking up operator time. Since the plate must be removed and cleaned approximately every eight hours, this is a significant problem with existing systems.

It is seen then that there is a need for an easily removable and replaceable ink mist collector for use on continuous flow ink jet printheads.

Summary of the Invention

This need is met by the system according to the present invention, wherein an easily replaceable apparatus collects ink mist formed on the bottom of a printhead. The mist collector apparatus of the present invention prevents the ink mist from dripping onto the image substrate.

In accordance with one aspect of the present invention, an ink mist collector assembly collects ink mist formed on a printhead of an ink jet printing system. The ink mist collector assembly comprises a magnetic surface, and a porous material attached to the magnetic surface to create a porous magnetic unit. The ink mist collector assembly further comprises means for engaging the porous magnetic unit to the printhead, to collect ink mist formed on the printhead.

Accordingly, it is an object of the present invention to provide an ink mist collector for solving the problem of mist formation on a printhead dripping onto the image substrate. It is a further object of the present invention to provide such an ink mist collector which is easily removable and replaceable. Finally, it is an advantage of the present invention that the easily replaceable ink mist collector is precisely registered to the printhead which enhances printhead performance.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

Brief Description of the Drawing

Fig. 1 is an exploded block diagram of a preferred embodiment of the easily replaceable mist collector system of the present invention.

Detailed Description of the Preferred Embodiments

The present invention provides for an easily replaceable mist collector with a porous bottom. The easily replaceable apparatus collects ink mist formed on the bottom of a printhead and prevents the ink mist from dripping onto the image substrate.

Referring now to Fig. 1, there is illustrated an easily replaceable mist collector 10, in accordance with the present invention. The device of the present invention registers precisely to the bottom of a printhead assembly 12. The printhead assembly is of the type manufactured by Scitex Digital Printing, Inc. of Dayton, Ohio, to accomplish graphic reproduction by selectively charging and deflecting the drops and depositing at least some of the drops on a substrate to form an image.

The ink jet printhead requires a wicking apparatus on the surface parallel to the image substrate to collect drops of ink and mist. This ensures that ink which forms on the bottom of the printhead will not drip onto the substrate surface. The printhead 12 may be any typical printhead, comprising, for example, a resonator 14 and associated resonator frame 16; a catcher 18 and associated catcher outlet 20.

Continuing with Fig. 1, 22 is a porous material, such as a hydroscopic polyethylene or other material with small open cell pockets. The porous material is mounted on the bottom side of the printhead and is held in place by an adhesive to a magnetic material 24, to create a porous magnetic structure 26. The adhesive may be any suitable adhesive, such as an acrylic adhe-

sive. Locating studs 28 register the porous magnetic plate 24 to the printhead 12. The printhead has reception apertures (not shown) for receiving the locating studs 28, to precisely locate the porous magnetic plate 24. This solves the heretofore existing problem of achieving registration of the mist collector 10 to the printhead assembly 12.

Since the printhead assembly 12 is made of magnetic stainless steel, the porous magnetic plate 24 is held directly to the printhead by magnetic attraction, without requiring clearance or additional plates for mounting. The attracting magnetic material of plate 24 is typically a rubber bonded composite comprising oriented barium ferrite in natsyn binder. This has the desired effect of decreasing the distance from the printhead to the image substrate.

In accordance with the present invention, the mist collector assembly 10 is easily removable from the printhead assembly 12. Since the plate 24 must be removed and cleaned approximately every eight hours, this is a significant advantage over existing mist collector assemblies, which require tools and time to remove. To remove the porous magnetic plate, such as for cleaning, the operator simply pulls the mist collector assembly away from the printhead, until the magnetic attraction is negated. This is accomplished quickly, without the use of any tools. When it is desired to reattach assembly 10 to assembly 12, the locating studs 26 are simply aligned with the reception holes in the printhead, to precisely locate the porous magnetic plate 24 to the printhead 12.

Industrial Applicability and Advantages

The present invention is useful in the field of ink jet printing, and has the advantage of preventing ink mist from dripping off of a printhead onto an image substrate. The present invention provides the further advantage of registering the ink mist collector directly to the bottom of a printhead. Finally, the ink mist collector of the present invention provides the advantage of being easily removable and replaceable.

Having described the invention in detail and by reference to the preferred embodiment thereof, it will be apparent that other modifications and variations are possible without departing from the scope of the invention defined in the appended claims.

Claims

1. An ink mist collector assembly for collecting ink mist formed on a printhead of an ink jet printing system, the ink mist collector assembly comprising:

   a magnetic material;
   a porous material attached to the magnetic material to create a porous magnetic structure; and
   means for engaging the porous magnetic structure to the printhead.

2. An ink mist collector assembly as claimed in claim 1 wherein the means for engaging the porous magnetic structure to the printhead comprises locating studs to register the porous magnetic structure to the printhead.

3. An ink mist collector assembly as claimed in claim 1 wherein the magnetic material comprises oriented barium ferrite in natsyn binder.

4. An ink mist collector assembly as claimed in claim 1 wherein the porous material comprises a hydroscopic polyethylene.

5. An ink mist collector assembly as claimed in claim 1 further comprising a means for attaching the porous material to the magnetic material.

6. An ink mist collector assembly as claimed in claim 5 wherein the means for attaching the porous material to the magnetic material comprises an adhesive.

7. An ink mist collector assembly as claimed in claim 1 wherein the printhead comprises a stainless steel printhead.

8. An ink mist collector assembly as claimed in claim 7 wherein the means for engaging the porous magnetic structure to the printhead comprises locating studs receivable into printhead reception apertures to precisely register the ink mist collector assembly to the printhead.

9. An ink mist collector assembly as claimed in claim 1 wherein the porous magnetic structure is easily removable and replaceable.

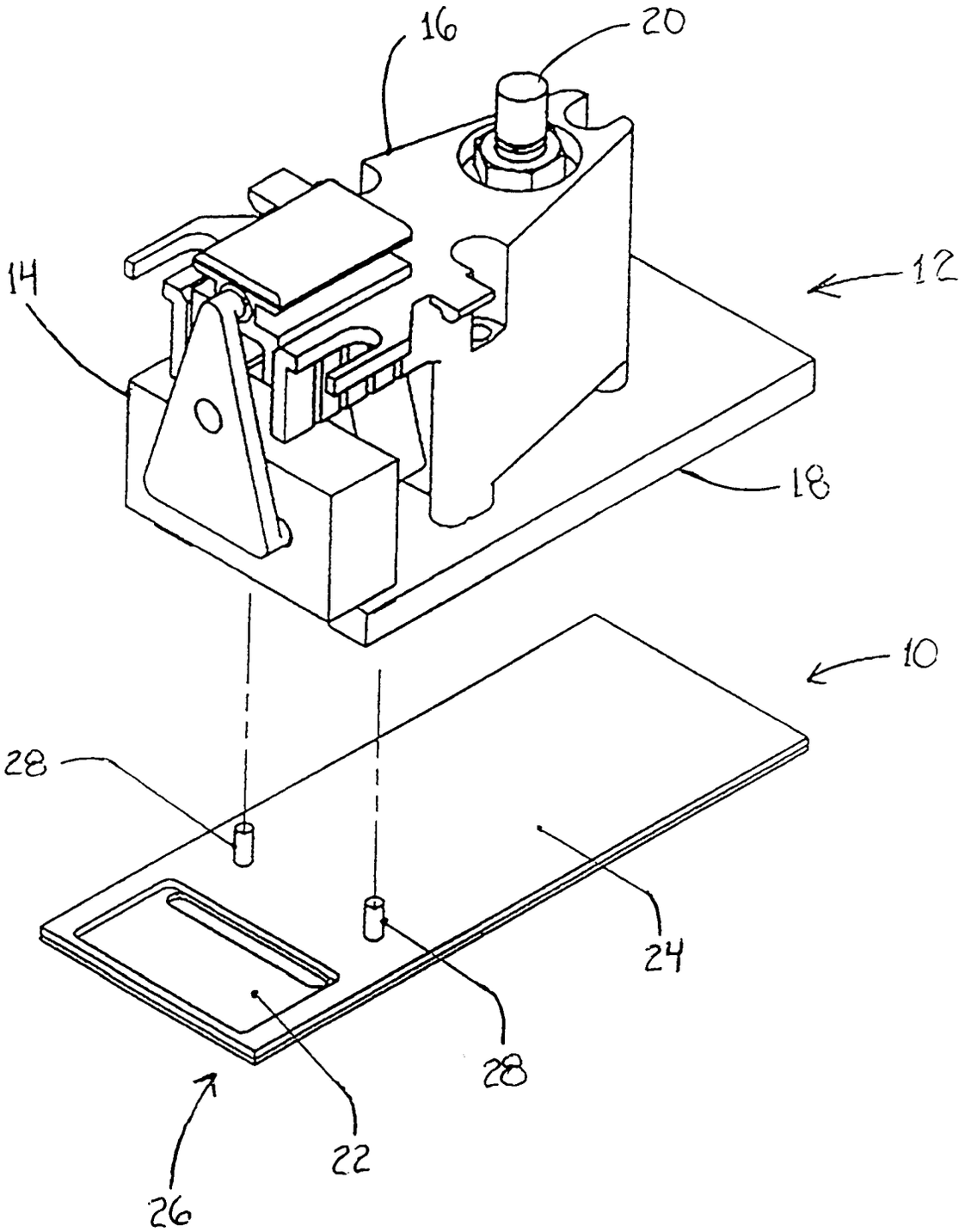


FIGURE 1