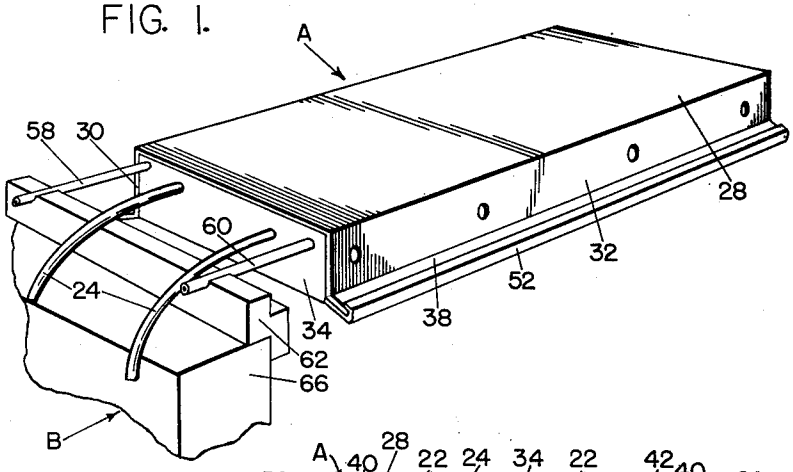
April 9, 1963 F. M. ANTONCICH 3,085,143

INK DRIER

Filed March 30, 1960

FIG. 1.



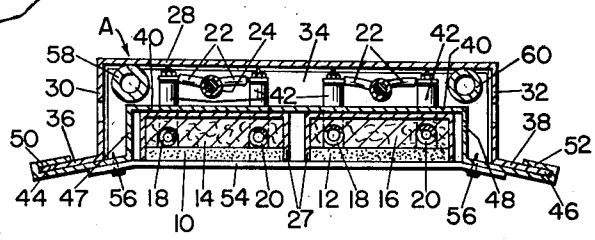


FIG. 2.

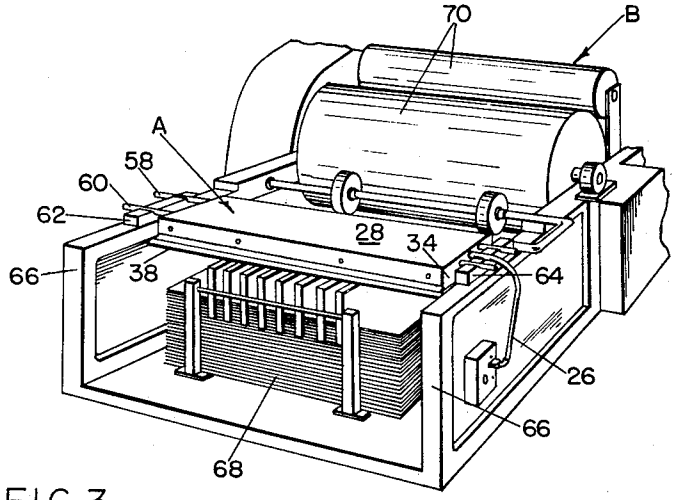


FIG. 3.

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INK DRIER

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This invention relates to an improvement in ink driers and deals particularly with an apparatus which may be supported to direct radiant heat against a newly printed sheet of paper to quickly dry the ink thereupon.

The drying of ink on a newly printed sheet is a problem which has bothered the printing industry for a great number of years. In many instances, gas burners have been mounted upon the delivery end of printing presses for heating the paperboard sheets or paper sheets as they travel past the flame. In other instances, the paper is trained about heated rolls which heat the entire sheet and assist in drying the ink. Such driers have the obvious disadvantage that the heat must under normal conditions be applied against the surface of the sheet opposite that bearing the ink so that the heat must travel through the thickness of the sheet to dry the ink. Heated drying tunnels and heat lamps have also been employed for this purpose. However, in previous forms of ink driers, the heat penetrates into the sheet sufficiently to affect the moisture contained within the sheet, causing the sheet to shrink, wrinkle or curl.

Another tremendous problem in the printing industry is the presence of static electricity in rolls and sheets of stock paper. Normally stock paper is kept and stored in such quantity that it may be subjected to a degree of heat in an attempt to lessen static electricity before the paper is used in printing. This process does not eliminate the static electricity but does lower it somewhat. Heat tubes and other forms of heating elements are attached to presses with the sole intention of lessening or eliminating static electricity. These tubes or heat elements have varying degrees of success depending on various conditions.

The use of the instant invention on the feeder end of a printing press has the added accomplishment of eliminating static electricity.

In the case of offset printing or multicolor printing the ink builds up on the sheet to such a degree that there is the constant danger of offsetting on the bottom of the overlying sheet. Consequently presses are equipped with a spray attachment which automatically coats the newly printed sheet with a light film of dust which is very often composed of cornmeal in powdered form. This dusting process causes dust to build up in areas of the pres which make it necessary to cease operations periodically in order to remove the dust from the press. This is a time consuming, costly process.

The use of the instant invention eliminates the necessity of the use of spray dusts since the ink dries almost instantaneously thereby eliminating any danger of offsetting.

Another important feature of this invention is the provision of an ink drier which may be used with a high degree of safety and which is extremely effective for its intended purpose.

In general, the device comprises an electrical heating element which is supported against a quartz plate which deflects the long infra red rays and causes these rays to be distributed evenly over the entire surface of the quartz plate. This particular type of heater gives off heat rays which develop a high degree of heat on the surface of the printed sheets without creating a high temperature in the air between the heater and the sheets. Furthermore, the rays issuing from the heater apparently have the property of reflecting from the surface of the sheet so that they are able to dry the ink on the surface without penetrating into the sheet to an extent necessary to appreciably change the moisture content of the sheet. As a result, the ink is dried without affecting the size of the sheet and without causing the sheet to shrink, wrinkle or otherwise change in shape. The degree of heat required may be regulated by the use of one or more of the heating elements within the drier. Should further adjustment be needed the drier may be moved closer or further removed from the surface of the newly printed sheet. The drier is absolutely safe with respect to causing paper to become ignited should the heat become intense. The nature of the radiant heat issuing from the quartz plate is such that paper in direct contact with the quartz plate will not ignite but will merely char.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification:

FIGURE 1 is a perspective view of the ink drier, portions of a printing press shown broken away.

FIGURE 2 is a cross sectional view through the device illustrated in FIGURE 1.

FIGURE 3 is a diagrammatic view of a portion of a printing press showing one manner in which the heater may be used to dry the ink.

With reference first to FIGURE 2 of the drawings, the heater generally indicated by the letter A includes a pair of quartz plates 10 and 12 of substantial thickness having panels 14 and 16 of asbestos or other suitable heat insulation overlying the inner or upper surface thereof. Heating elements 18 and 20 are embedded in the surface of the asbestos panels which are in face contact with the plates 10 and 12. The heating elements may also lie in surface contact with the plates 10 and 12. Each of these plates and panel structures are provided with electrical conductors 22 and are provided with separate electrical cords and plugs 24 such as are shown in FIGURE 1, or are connected together in parallel and supplied with current by a single cord and plug 26 such as is shown in FIGURE 3.

Each of the heating units or assembled panels of asbestos and their respective quartz plates are enclosed in metal channels 27. These channels tend to absorb heat which would otherwise be transferred to the aluminum housing presently to be described.

The plate and panel assembly is enclosed in a housing having a base 28 and side walls 30 and 32. The end walls 34 are unitary and form the ends of the housing. The side walls 30 and 32 are provided with outwardly extending wings 36 and 38 for purposes later to be described.

The housing is further provided with an inner reflector 40 which has a threefold purpose. It serves as a baffle between the electrical conductors and housing base and the plates and panels which become hot during operation so that the heat is directed downwardly rather than upwardly through the housing base 28 or the sides 30 and 32. Further, the inner reflector acts as a stabilizer for the plates. The porcelain electrical outlet tubes 42 extend through the reflector thereby maintaining the plates and panels in parallel spaced relation within the reflector. The reflector may be secured to the housing in a variety of ways but the method illustrated in FIGURE 2 is preferable both from a maintenance standpoint and in production costs. The reflector is provided with wings or extensions 44 and 46 which extend outwardly from the side walls 47 and 48. These wings are further provided with portions which overlie the wings 36 and 38 of the housing as indicated at 50 and 52.

The plates 10 and 12 are held within the reflectors by a plurality of cross straps 54 which are normally narrow bands of aluminum or the like and are in face contact

with the exposed surface of the quartz plates. These bands or straps may be secured by screws **56** or the like to the housing or to the reflector wings **44** and **46** as shown in FIGURE 2.

The heater A is further provided with supporting arms or rods **58** and **60** which may extend the entire length of the housing to extend beyond the ends thereof to a point where they are supported on blocks **62** and **64**. These blocks are formed of a yieldable material such as a relatively hard rubber substance and are provided to minimize transmission of vibration to the heater when mounted on a printing press.

Obviously the heaters may be constructed in different sizes to adapt them to various sizes and types of printing presses. One manner of mounting the heater is illustrated in FIGURE 3. The heater A is mounted on the framework **66** of the printing press which is indicated generally by the letter B. Printing presses are varied in many ways but all have at least one thing in common. They are all provided with a delivery end or an area where the finished printed sheets such as the sheets **68** come to rest after being trained through the printing rollers **70**. The heater A is mounted directly above the area where the printed sheets come to rest. Heat from the heater is radiated in a controlled area directed by the reflector and the angle of the wings on the housing.

Another method of utilizing the heaters in a multi-color printing operation is to arrange heaters between printing color units so that one coler printed phase is adequately dried before the next color is applied to the sheet. The colors retain a greater degree of brilliancy as well as being kept clean on the printed sheets.

A further utilization of the heaters of this type includes the drying of photographic plates such as magenta masks. Normally plates of this type require about 2½ to 3½ hours of drying time in a specially ventilated room or cabinet. The use of the instant invention cuts the drying time to ½ hour without the aid of a fan or any special equipment.

In accordance with the patent statutes, I have described the principles of construction and operation of my improvement in ink driers, and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A radiant heater for use in drying ink in a printing apparatus, the heater including an elongated plate formed of fused quartz, a heat insulating panel in face contact with one surface of said plate, an electric heating element embedded in said panel in contact with said plate, a housing having a base overlying said panel and plate, side walls enclosing the sides of said panel and plate and end wall enclosing the ends of said panel and plate, a reflector within said housing spaced from said base and said side walls, said sides of said housing having outwardly extending wings, said reflector having outwardly extending portions enclosing said outwardly extending wings on said sides of said housing for holding said reflector in spaced relation within said housing, and means for supporting said housing with the other surface of said plate directed toward a printed sheet on the printing apparatus,

2. The structure of claim 1 and including supporting rods secured to said housing and extending beyond opposite ends thereof in substantially parallel relation.

3. The structure of claim 2 and including carrier blocks formed of a yieldable material and mounted on said printing apparatus and having notches therein adapted to register with said supporting rods.

4. A radiant heater including a quartz plate, a heat insulating panel in face contact with one surface of said plate and contiguous thereto, an electric heating element embedded in said panel in contact with said plate, a channel including a base overlying said panel and substantially equal in width thereto and sides enclosing and engaging the sides of said panel and plate to hold them in contiguous relation, said insulating panel and quartz plate filling said channel, and means for supporting said channel.

5. A radiant heater including a quartz plate, a heat insulating panel in face contact with one surface of said plate and contiguous thereto, an electric heating element embedded in said panel in contact with said plate, a channel including a base overlying said panel and substantially equal in width thereto and sides enclosing and engaging the sides of said panel and plate to hold them in contiguous relation, said panel and plate filling said channel, a reflector having a central portion secured to said channel and side portions extending outwardly of the channel sides and in spaced relation thereto.

6. A radiant heater including a quartz plate, a heat insulating panel in face contact with one surface of said plate and contiguous thereto, an electric heating element embedded in said panel in contact with said plate, a channel including a base overlying said panel and substantially equal in width thereto and sides enclosing and engaging the sides of said panel and plate to hold them in contiguous relation, a reflector having a central portion secured to said channel and side portions extending outwardly of the channel sides and in spaced relation thereto, terminals connected to said heating element and extending through, and insulated from, said channel base and central portion of said reflector, and an outer housing including side and end walls enclosing said reflector and said channel, means connecting the outwardly extending side portions of said reflector to the side walls of said housing to hold the same spaced, said housing also including a base wall connecting said side and end walls thereof and spaced from the center portion of said reflector the extent necessary to enclose said terminals.

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