

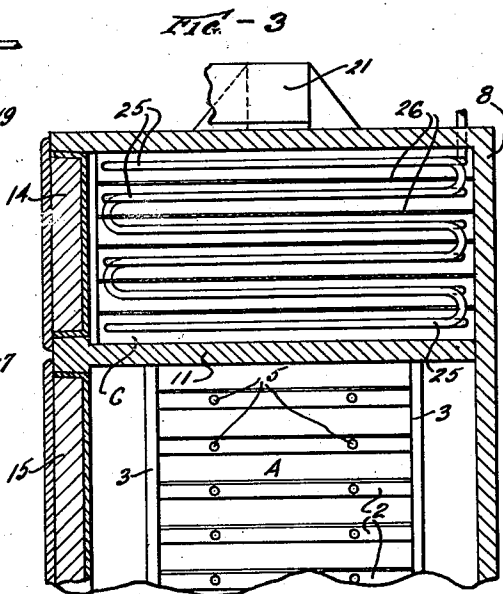
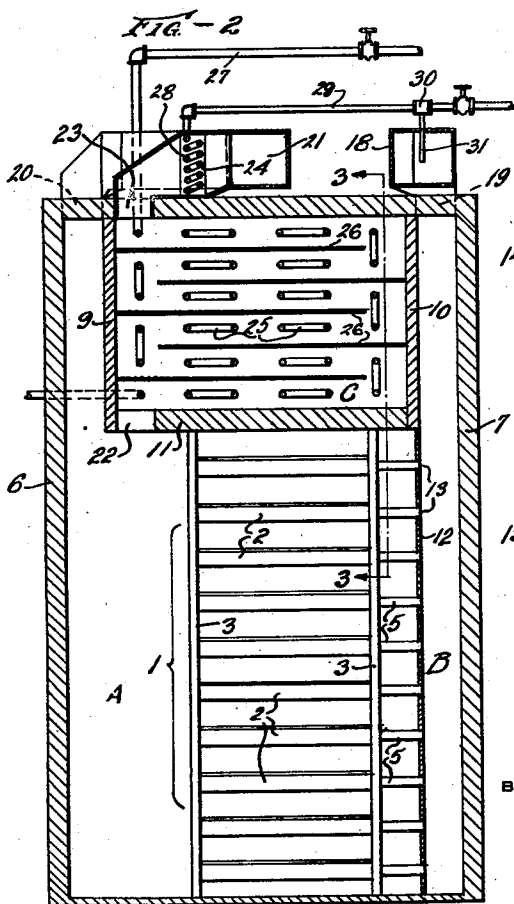
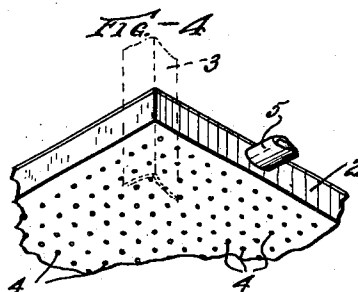
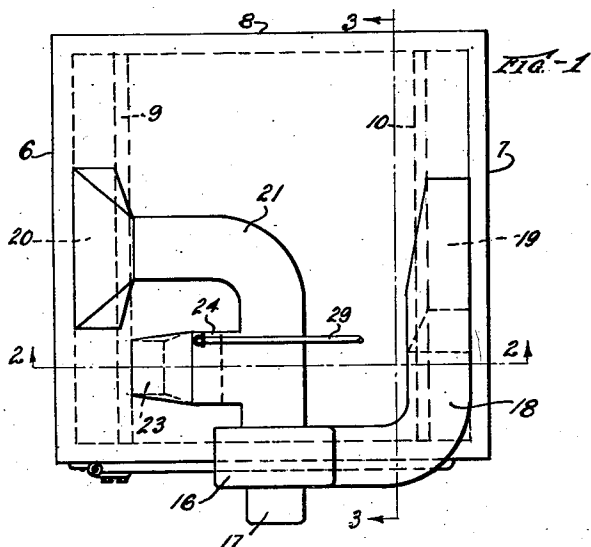
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T. CHESTER

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DRYING APPARATUS FOR GELATIN CARBON TISSUE

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DRYING APPARATUS FOR GELATIN CARBON TISSUE

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This invention relates to drying apparatus for gelatin carbon tissues, employed in the illustrating process known as rotogravure.

5 The rotogravure process, as do most of the processes pertaining to the printing arts, includes a large number of delicate operations and involving the use of the fragile carbon tissues to which reference has been made. Such tissues are well known in the art and comprise thin paper backings coated with gelatin emulsions, and the process of their employment is outlined as follows:

10 The tissue as received is not sensitized to light and must be prepared for use by subsection to a sensitizing potassium bichromate bath. The tissue is next squeegeed face down on a polished metal ferrotype plate on which it is dried. Thereafter the tissue is peeled from the plate and stored in light-proof means until it is to be used.

Ordinarily several sheets of tissues are so sensitized and prepared at once and preferably a relatively short time before their use is intended.

25 When one of the sensitized tissue sheets is to be employed it is printed upon by exposure to light through a photographically obtained "positive", developed, fixed and washed as is usual in the photographic art.

30 Next comes the process wherein the tissue sheet is wrapped and squeegeed around a polished copper cylinder, which is then subjected to a hot water bath for a period of time sufficient to disintegrate the paper backing from the emulsion of the tissue, and indeed, remove part of the gelatin thereof dependent upon the pattern of the positive. The cylinder is then dried and subjected to a ferric etching solution which lightly etches into the exposed surface portions of the copper cylinder the pattern determined by the original positive. After cleaning, the cylinder is placed in the press where it is successively inked and impressed upon paper fed through the press in the usual manner of printing.

45 The ferrotype plates, particularly in some cases as where newspaper pictorial supplements are to be printed, are of considerable

area, running in newspaper work to around 46" x 29"; and the etching is very light. Further, competition among publishers dictates an extremely high quality of work, and it will be appreciated that very great care must be employed throughout the progress of the carbon tissue.

55 Perhaps the most fruitful and least understood source of inaccuracies in the product is in the drying of the tissue on the ferrotype plates, the general practice in the art heretofore being to use the greatest care and skill in otherwise handling the tissue sheet but, inconsistently enough, to dry the same by standing its ferrotype plate on edge and directing thereagainst the breeze from an electric fan. The result is invariably that some of the water with which the paper is saturated works down by gravity effecting a distortion in the tissue. Moreover where atmospheric or room air is employed, in winter such air is usually so dry that the tissue is too rapidly dried out while in summer such air is usually too warm and too humid; in either case producing still further distortion of the tissue. This method also obviously subjects the tissue backing to all the dust and foreign matter in the atmosphere which later finds its way to produce relatively minute but distinct inaccuracies in the copying printing cylinder.

60 My invention is directed toward the process of drying the tissue on the ferrotype plates, and involves so controlling the conditions of the drying operation that the same is independent of weather or room conditions and results in a very substantial superiority and exact uniformity of product.

65 To this end I provide a chamber in which the tissue is dried, and arrange for circulating the dry medium, such as air, through the chamber, and for conditioning the medium before the tissue sheets are exposed thereto, preferably re-circulating the same so that outside dust is not accumulated thereby. Further, in order that a number of ferrotype plates with their sheets of tissue may be accommodated, and that each sheet may receive an even distribution of air over its surface, and that the air may find free

exit from the sheets, I provide in the chamber through which the air is circulated, a rack of shelves of novel construction as will appear more in detail hereinafter.

5 The exact nature of the invention together with further objects and advantages thereof will be apparent from the following description, taken in connection with the accompanying drawings, in which Fig. 1 is a
10 plan view of apparatus in which my invention is incorporated; Fig. 2 is a vertical section partly diagrammatic but generally in the plane of line 2—2, Fig. 1; Fig. 3 is a detailed vertical section as in the plane
15 3—3, Fig. 1; and Fig. 4 is a detail in perspective of a corner of one of the shelves employed.

With reference now to the drawings, I provide a rack 1 having a number of horizontal rectangular shelves 2 supported as
20 by means of the corner posts 3, each shelf being of sufficient supporting area to receive and support a ferrotype plate bearing a sheet of gelatin carbon tissue.

25 Each of the shelves 2 is hollow, as of sheet metal, and is really an air box, is provided as on its under side as indicated Fig. 4, with a number of relatively small and closely spaced perforations 4, and has on one edge
30 one or more connections 5 whereby a drying fluid may be supplied to the shelf air box.

I arrange the rack 1 within an enclosure having its left and right side walls 6 and
35 7 and rear wall 8 well spaced from the rack. Above the rack I arrange a container or, as indicated in the drawings and by the partitioning members 9, 10 and 11, a compartment or subenclosure. Extending downwards of the right-hand wall 10 and between
40 the rear wall of the compartment and the front wall thereof is a partition 12 having openings 13 corresponding with the connections 5 of the shelves 2, the connections 5 being secured in these openings as
45 indicated Fig. 2. The space bounded by the walls 7, 8 and partitions 10 and 12 thus forms a chamber B through which access may be had with the chamber A in which the rack 1 is located, by way of the openings
50 13, connections 5, the hollows of the shelves 2 and the perforations 4, free exit from between the shelves being had on all sides thereof.

55 Upper and lower doors 14 and 15 are provided as indicated Fig. 3, which together with the parts already described, substantially form of the interior of the enclosure, the chambers A and B as set forth and the
60 chamber C in the upper portion thereof.

A blower 16 as of the centrifugal type indicated, and driven by a motor 17 and which may be located above the enclosure
65 is provided, and by means of the fan outlet duct 18 is arranged to deliver a drying

medium such as air, through an inlet opening 19 to the chamber B.

The upper portion of the chamber A lying between the wall 6 and partition 9 has an outlet opening 20, and a fan inlet duct 21
70 is arranged as indicated. Thus, with the doors closed operation of the fan will cause a circulation from the chamber B to the chamber A by way of the shelves so that a drying medium will be directed downwards
75 upon carbon tissue mounted on ferrotype plates resting upon the shelves, the perforations 4 insuring even distribution over the tissue sheets.

The partition 11 is provided with an opening 22 by which communication is had between the compartments A and C, and the compartment C has communication with the duct 21 by way of an opening 23 in the
80 upper wall of the enclosure and a branch duct 24; whereby communication between the chamber A and the fan is had by the two paths described, one including the chamber C and each forming a by-pass for the
85 other.

Within the chamber C are arranged a number of coils 25 interspaced by baffle plates 26 and having connection as by pipe
90 27 with a source of refrigerant with which the coils form a refrigerating unit.

Within the branch duct 24 are coils 28 having connections as by pipe 29 with a source of heating medium such as steam, the steam supply to the coils 28 being conveniently controlled by a thermostatic valve 30
95 actuated by a thermostatic unit 31 in the fan outlet duct 18, although it will be understood that the unit 31 might be located in the fan inlet duct 21.

Operation of the apparatus in drying carbon tissue placed on the shelves 2, access to which for the purpose is had through the door 15, will be evident. Operation of the fan 16 effects circulation and recirculation as
105 already described causing a draft of air evenly downwards upon the tissue sheets and away therefrom in all directions. The proportions are preferably such that about 10% of this air passes through the chamber C. In the chamber C presuming the coils 25
110 actively refrigerant, this portion of the air is caused to drop its moisture as will be understood; and as this air subsequently passes over the heating coils 28 it is again brought to the desired temperature, which I find to be about 68° F., the proper heating coil temperature being maintained by the thermally responsive valve 30.

The portion of air thus conditioned is mixed in the fan 16 with that portion of the circulating air by-passed around the chamber C the tissue sheets being subjected to this mixture as will be well understood by one familiar with the air conditioning art; however, the whole of the recirculating air
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is substantially constantly maintained in the proper conditions of temperature and humidity to produce a constant drying effect entirely independent of weather or other general atmospheric conditions.

to support a ferrotype plate bearing a sheet of tissue, said shelves being hollow and perforate on their under sides and having connection with a source of drying medium, the arrangement being such that said medium will be directed downward from a shelf and against the tissue on the shelf below.

Signed by me, this 24th day of July, 1928.

THOMAS CHESTER.

5 What I claim is:

1. Apparatus of the character described and comprising means for supporting plates to be dried, means for directing a drying medium upon said plates, means arranged about said parts to form a drying chamber within which the parts are located, means providing a second chamber, said directing means having supply connection with said second chamber, means providing a third chamber communicating with said first chamber, refrigerant means having a cooling surface in said third chamber, means effecting circulation from said first and third chambers to said second chamber and hence from the second to the first chamber through said directing means, and heating means arranged in the flow of circulation from the third to the second chamber.

2. Apparatus of the character described and including a plurality of shelves each adapted to support a ferrotype plate bearing a sheet of tissue, said shelves being hollow and perforate each on one side, and their hollows having connection with a source of drying medium, the arrangement being such that said medium will be directed from a shelf and against the tissue on the adjacent shelf.

3. Apparatus of the character described and including a rack of shelves each adapted to support a ferrotype plate bearing a sheet of tissue, said shelves being hollow and perforate each on one side, and having connection with a source of drying medium, the arrangement being such that said medium will be directed vertically from a shelf and against the tissue on the adjacent shelf, an enclosure for said rack, means for conditioning said medium, and means for circulating the same through said conditioning means, said shelves and said enclosure.

4. Apparatus of the character described and including a rack of shelves each adapted to support a ferrotype plate bearing a sheet of tissue, said shelves being hollow and perforate each on one side and having connection with a source of drying medium, the arrangement being such that said medium will be directed vertically from a shelf and against the tissue on the adjacent shelf, an enclosure for said rack and having walls spaced from said shelves whereby said medium may find exit from between the shelves on all sides thereof, means for conditioning said medium, and means for circulating the same through said conditioning means, said shelves and said enclosure.

5. Apparatus of the character described and including a rack of shelves each adapted

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