Oct. 15, 1935. T. F. PINDER 2,017,257

APPARATUS FOR PREVENTING PRINT OFFSET

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Fig. 1.

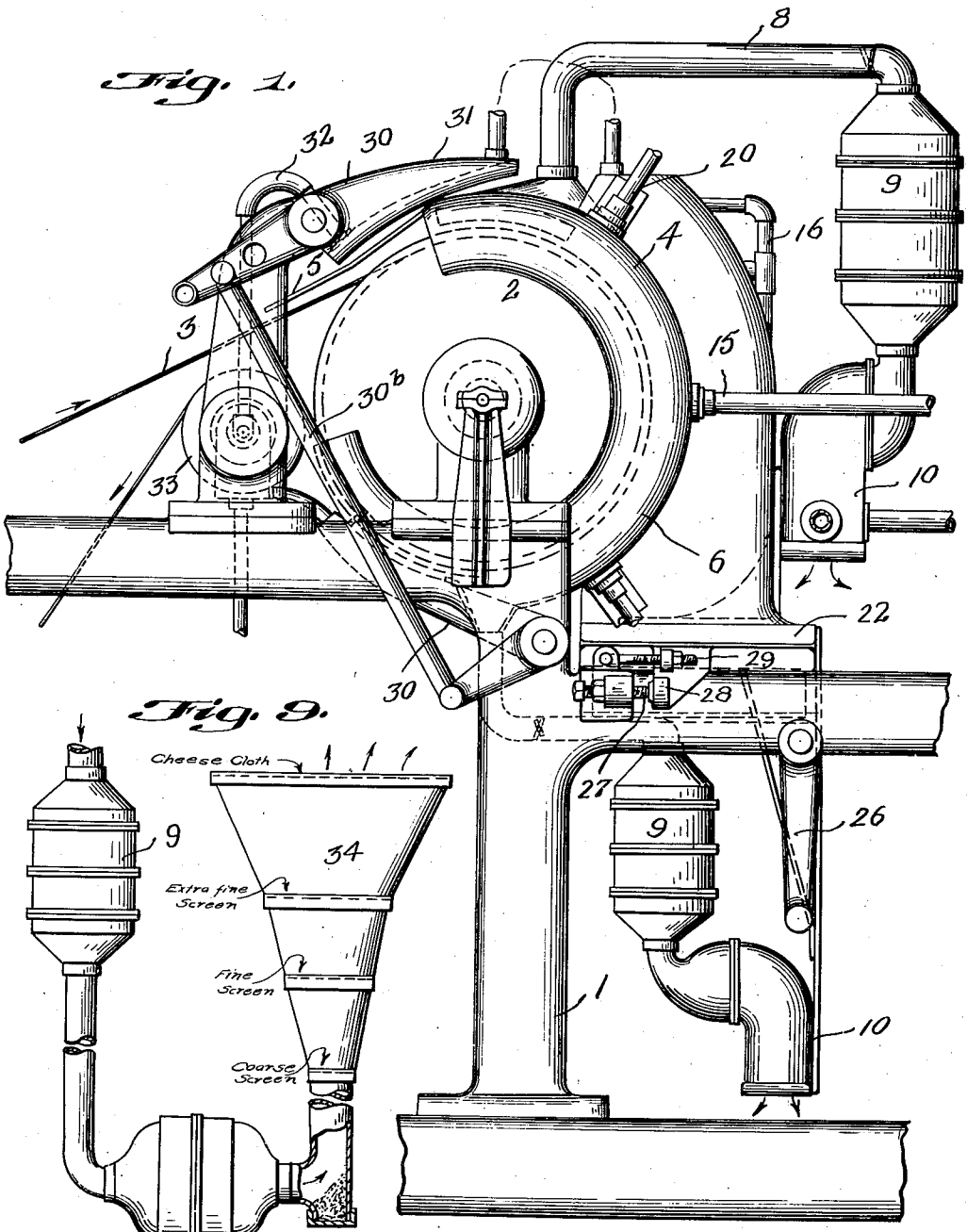


Fig. 9.

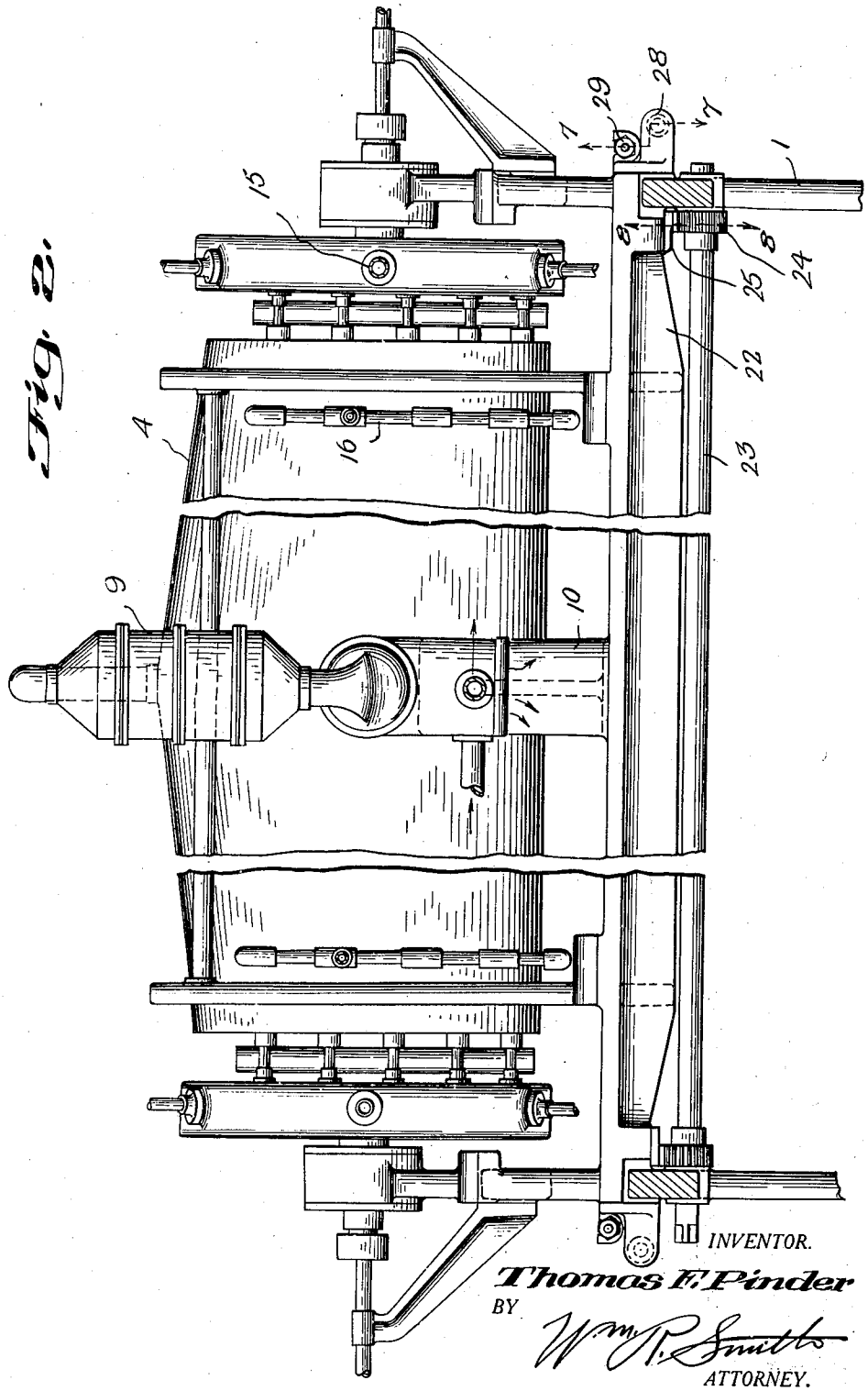
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Fig. 2.



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Fig. 3.

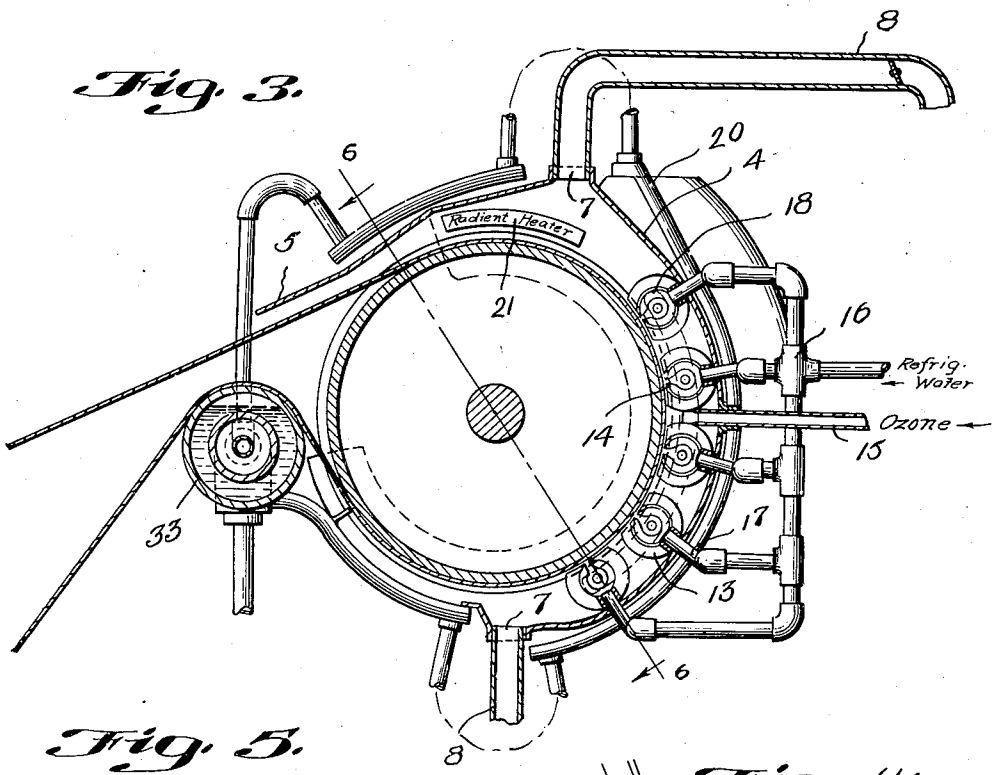


Fig. 5.

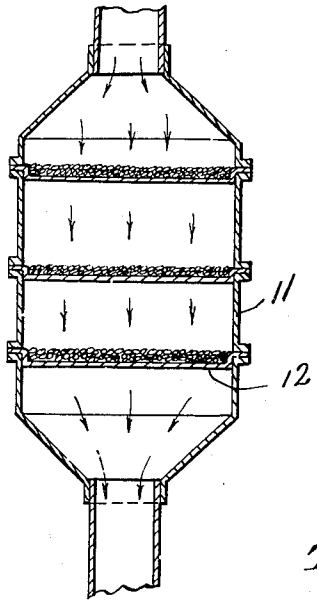
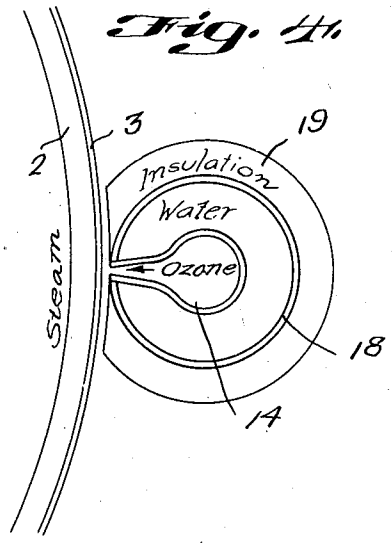


Fig. 4.



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Fig. 6.

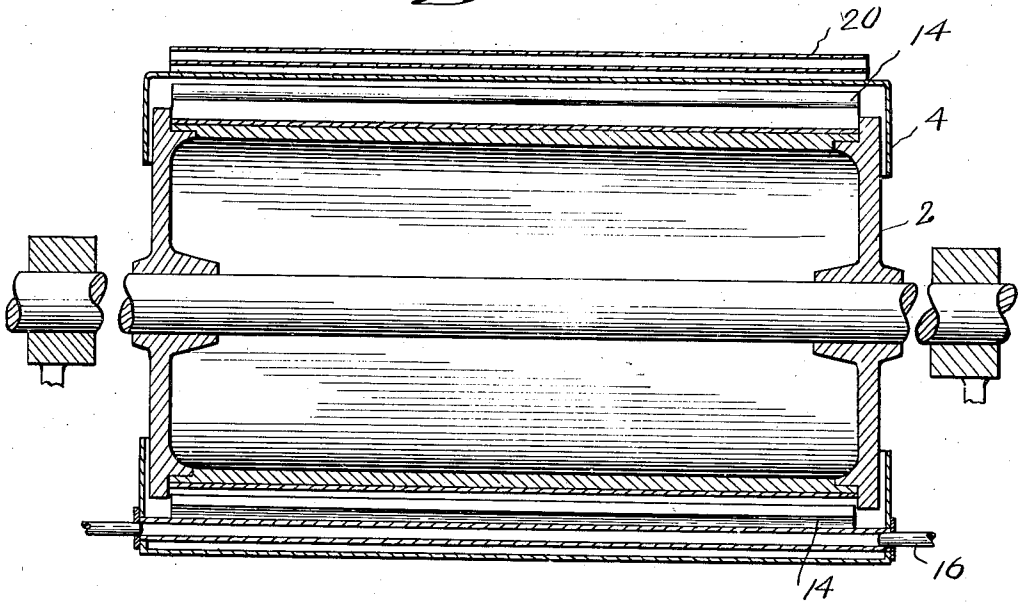
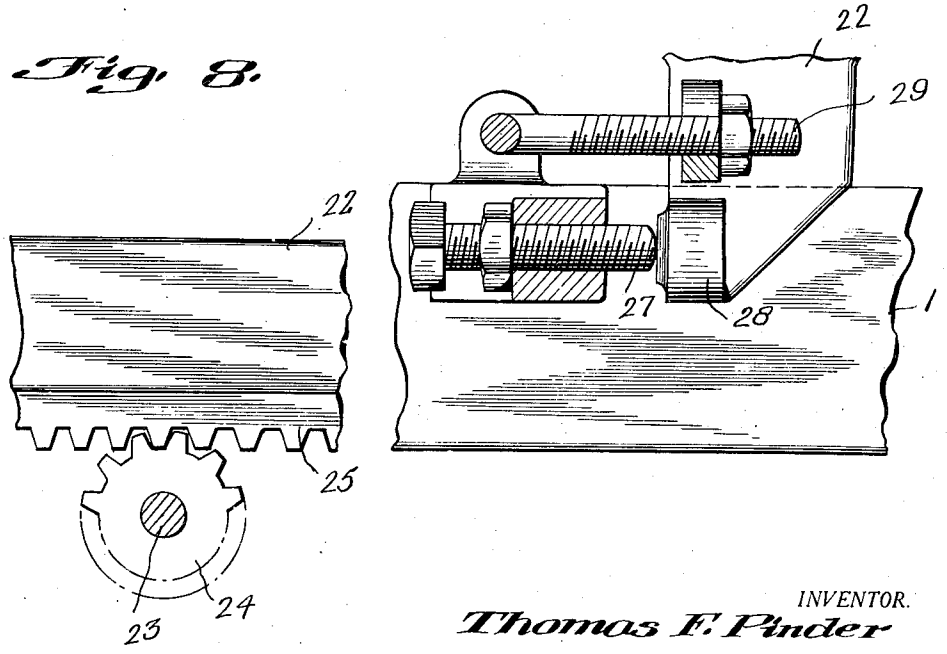


Fig. 7.

Fig. 8.



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Patented Oct. 15, 1935 2,017,257

UNITED STATES PATENT OFFICE

2,017,257

APPARATUS FOR PREVENTING PRINT OFFSET

Thomas Fenn Pinder, Merion, Pa.

Application January 2, 1932, Serial No. 584,471

8 Claims. (Cl. 101—416)

It is an object of my invention to produce an unique type of apparatus whereby the temperature of ink will be raised to the necessary high degree and subjected to a cool application of ozone of the proper concentration, accomplishing these desired objectives by a mechanism that may be quickly shifted towards and away from the web of paper which enables immediate removal of the heat applicator from the web of paper when the machine stops and enables the proper feeding of the web of paper through the press without interference with my apparatus.

It is also an object of my invention to design an apparatus that will create the desired heat intensity, will provide the proper quantitative discharge of ozone of the proper concentration upon the ink and which will destroy the ozone after the useful application thereof.

A feature of my invention resides in the use of a unique adjustable support for the ozone nozzles and associated parts whereby the nozzles may be quickly brought into relation with the paper feeding rolls and then fine micrometer adjustments accomplished for assuring accurate relation between the outlets of the nozzles and the surface of the printed sheet.

My improved apparatus incorporates driers for generating excessive heat and high concentration of ozone for instantaneous application to the ink and immediately thereafter completely destroy the applied ozone and heat.

With these and other objects in view the invention will be better understood from the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is an end elevation of my improved apparatus.

Figure 2 is a side elevation thereof

Figure 3 is a cross sectional view.

Figure 4 is a diagrammatic view of a portion of the ozonator.

Figure 5 is a sectional view through the ozone destroying apparatus.

Figure 6 is a sectional view on line 6—6, Figure 3.

Figure 7 is a detailed view of the adjustor.

Figure 8 is a detailed view of a portion of the carriage.

Figure 9 is a side elevation of a modification of my invention.

My apparatus is applied to the frame 1 of the printing machine without alteration thereto. Mounted directly upon this frame is a heating device illustrated as a drum 2 around which the paper web 3 travels. This drum is heated in any suitable manner preferably by a fluid such as steam, hot water or hot oil. Encasing the major portion of the peripherial surface of the drum 2 and a portion of the end walls thereof is a hood 4 including a deflector 5, of a flexible construction so as to move with the hood when the latter is retracted from the drum in a manner hereinafter described. This hood 4 has side flanges 6 paralleling the end walls of the drum and the hood and is further provided with outlets 7 which communicate with conduits 8 that communicate with ozone destroying apparatus 9, that in turn communicate with coolers 10 each of which may be of a special radiator type well known on the market.

Each apparatus 9 may be constructed in many ways but for the purpose of illustration, I have shown in Figure 5 the apparatus as consisting of a casing 11, housing trays 12 that support chemicals that will destroy the ozone as passing thereby. Housed within the hood 4 is my improved ozonator 13 consisting of a plurality of nozzles 14 communicating with an ozone feeding pipe 15. As shown in Figure 6, these nozzles extend the length of the drum and have their outlets in close proximity to the periphery of the drum which I have found from actual experience is very, very important as it is absolutely necessary that ozone of the proper concentration be instantly projected onto the ink as passing thereby.

I have found from actual experience that heat will destroy ozone but what is most important is the fact that the heat will so rapidly expand the ozone that its concentration is lowered. It is also important that the ozone outlets or slits be arranged in close proximity to the ink and this ozone be chilled by cooling system indicated broadly by the numeral 16. It is also important, in view of the small time interval of application available, approximating about one-half second. This cooling system 16 includes distributor pipes 17 communicating with cooling jackets 18 surrounding the nozzles or slits 14. It may be advisable to provide an insulating covering 18 for the cooling jackets. Also associated with the hood 4 is a cooling device 20 positioned to cool the hood and prevent radiation of heat therefrom into the surrounding atmosphere. Carried by the hood 4 is an electric heater 21 that performs the dual function of assisting the heat of the drum 2 by absorption from the top of the ink and also destroying any ozone tending to leave the hood. I have found from actual experience that it is very important that the ink be brought to the required temperature and I have

found that this can be satisfactorily accomplished by providing a heating roll for directly heating the paper and through the paper the ink and providing a radiant heat for directly projecting heat rays onto the wet ink which in turn absorbs rapidly. This radiant heater is directly carried by the hood so as to move therewith when the hood is withdrawn from the drum 2 in a manner now to be described.

The hood and associated parts including the ozone destroying apparatus are mounted on a carriage 22 that in turn slides on the frame 1 and is mechanically moved by a shaft 23 provided with gears 24 meshing with rack bars 25 directly connected to the carriage. An operator manipulating the handle 26 attached to the shaft will move the carriage toward and away from the drum. As the distance between the outlets of the ozone nozzles and the ink to be treated has a definite controlling influence upon the successful drying of the ink, it is very important that the outlets of the ozonator be fixed in a definite relation to the peripheral surface of the drum. I readily accomplish this by providing a micrometer set screw 27 mounted in the path of travel of the lug 28 or the carriage so as to abut therewith when the nozzles are at the proper distance from the periphery of the drum. When this has been accomplished, a lock bolt 29 is drawn into locking position to hold the carriage in its adjusted position. By this construction it will be appreciated that the carriage and associated parts may be quickly moved into accurate relation with the drum 2 and immediately removed therefrom to allow proper feeding of the paper web through the press and to immediately remove heat from the paper web when the machine stops operation.

I have found from actual experience that there is a decided advantage to be obtained from providing temperature regulators 30 contiguous to the forward position of the drum 2 so as to regulate the temperature of the web of paper. The temperature regulators 30 are pivotally mounted to swing toward and away from the periphery of the drum 2 and may be manually manipulated by the link mechanism 30b. These temperature regulators are in the form of hollow segments 31 intercommunicating with each other through hose connections 32 and a source of cooling fluid. Associated with the temperature regulators 30 is a hollow cooling drum 33 over which the web 3 passes in leaving the treating apparatus.

In Figure 9 I have shown a cleaner 34 associated with the ozone discharging apparatus which may be of any desired construction well known in the art.

What I claim is:

1. An ink treating apparatus comprising in combination a heating drum around which a freshly printed web of paper is adapted to pass, ozonators mounted for adjustments toward and away from said drum, means for giving final micrometer adjustments to the ozonators in relation to said drum and means for subjecting the printed web of paper to a cooling treatment at a predetermined point in its travel over the periphery of the drum.

2. An ink treating apparatus comprising a heating drum around which a freshly printed web of paper is adapted to pass, ink drying fluid jet means arranged about a section of said drum, and means for subjecting the printed web of paper to a cooling treatment at a predetermined point in its travel over the periphery of the drum.

3. An ink treating apparatus comprising a heating drum around which a freshly printed web of paper is adapted to pass, ink drying fluid jet means arranged about a section of said drum, means for subjecting the printed web of paper to a cooling treatment at a predetermined point in its travel over the periphery of the drum, said last mentioned means including a plurality of adjustably mounted cooling segments, and a link mechanism interconnecting said segments for uniformly adjusting the same in relation to the web of paper passing over the surface of the drum.

4. An ink treating apparatus comprising a heating drum around which a freshly printed web of paper is adapted to pass, ink drying fluid jet means arranged about the normal rear section of said drum, means for subjecting the printed web of paper to a cooling treatment at a predetermined point in its travel over the periphery of the drum, said last mentioned means including a pair of cooling segments, each disposed on the opposite normal forward sections of the drum and mounted for adjustment with respect thereto, and a link mechanism interconnecting said segments for uniformly adjusting the same in relation to the web of paper passing over the surface of the drum.

5. An ink treating apparatus comprising in combination, a heating drum around which a freshly printed web of paper is adapted to pass, ink drying fluid jet means arranged about a section of said drum, heating means positioned about another section of said drum, a hood encasing the major portion of the drum and mounted for movement with respect thereto, said hood enclosing and supporting the jet means and the heating means, and a cooling device disposed upon the outer face of said hood.

6. An ink treating apparatus comprising in combination, a heating drum around which a freshly printed web of paper is adapted to pass, ink drying fluid jet means arranged about a section of said drum, heating means positioned about another section of said drum, a hood encasing the major portion of the drum and mounted for movement with respect thereto, said hood enclosing and supporting the jet means and the heating means, a cooling device disposed upon the outer face of said hood and made rigid therewith, and means adjustably supporting said hood for moving the latter together with the jet means, the heating means, and cooling device as a unit in relation to the surface of said drum.

7. An ink treating apparatus comprising in combination, a heating drum around which a freshly printed web of paper is adapted to pass, a battery of ozonators arranged about a section of said drum, a heater positioned about another section of said drum, a hood encasing the major portion of the drum and mounted for movement with respect thereto, said hood enclosing and supporting the battery of ozonators and the heater, a cooling device disposed upon the outer face of said hood and made rigid therewith and means adjustably supporting said hood for moving the same, together with the battery of ozonators, heater, and cooling device as a unit, in relation to the surface of said drum.

8. An ink treating apparatus comprising in combination, a heating drum around which a freshly printed web of paper is adapted to pass, a battery of ozonators arranged about a section of said drum, a heater positioned about another section of said drum, a hood encasing the major

portion of the drum and mounted for movement with respect thereto, said hood enclosing and supporting the battery of ozonators and the heater, a cooling device disposed upon the outer face of said hood and made rigid therewith, means adjustably supporting said hood for moving the same, together with the battery of ozonators, heater, and cooling device as a unit in relation to the surface of the drum, and a cooling unit mounted separately of said hood for subjecting the treated ink to a cooling treatment at a predetermined point in the travel of the paper over the periphery of the drum, and means associated with said cooling unit for displacing the same with respect to the drum independently of said hood.

THOMAS FENN PINDER.