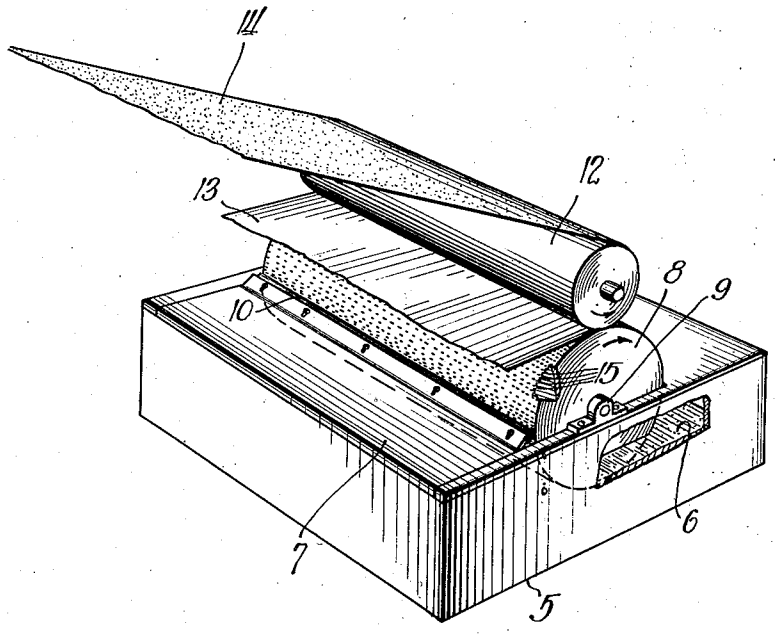
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METHOD OF AND MEANS FOR PREVENTING OFFSET

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METHOD OF AND MEANS FOR PREVENTING OFFSET

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This invention relates to a method of and means for preventing what is commonly termed in the printing art as "offset" between freshly printed rolls or sheets of stock, such as paper, cardboard, and similar print-carrying media.

It is a known disadvantage in the printing industry to have offsetting occur between freshly printed paper stock or the like. This is due to the fact that after the paper, cardboard, or similar stock has been printed, or has had letters or designs applied thereto by similar processes such as lithographing, "rotogravure" and the like, there has heretofore been considerable difficulty in preventing the ink from staining surfaces with which it might come into contact. Such surfaces may comprise the hands or clothing of persons handling such stock, or adjacent surfaces of paper, cloth or the like, such as when freshly printed sheets are stacked or folded.

Previous methods of preventing such offsetting with which I am familiar comprise the application of wax or paraffine in a molten state to the printed sheet of stock, such as disclosed in the patent to Grammer, No. 1,445,273, of February 13, 1923, or the spraying of the sheet with a solution consisting of a fast drying solvent and a solute of the lacquer or cellulose derivative class, as disclosed in my copending application, Serial No. 582,919, filed December 24, 1931, and issued April 27, 1937, as Patent No. 2,078,790. Various other types of solutions having the desired characteristics of solubility at room temperature in a fast-drying solvent and capable of forming minute spacing globules or lands on the printed stock, for spray application to the sheet, have been employed.

The present invention is directed particularly to the mechanical application of an anti-offsetting medium to the printed stock by passing the printed material between rollers, one of which coats the material with the anti-offsetting medium by contact therewith.

It is a main object of the present invention to provide a method of applying such anti-offsetting media to the printed stock during passage of the stock past a given point by mechanical contact of a medium-carrying roll with the printed surface.

Another object of the invention is the provision of a means for applying the anti-offsetting medium in desired form to the printed stock, the applying means being varied in accordance with the character of the printed stock and the protection desired against offsetting.

The essential feature of my invention is the provision of a coating or applicating roller which is so formed on its surface as to have a multitude of small depressions therein which vary in number, depending on the porosity of the paper which is being run through the machine. As the paper or similar stock contacts the roller, the medium carried in the depressions is deposited on the paper in the form of minute individual dots or lands. These lands are preferably transparent so as not to interfere with the visibility of the printed matter, and are quick-drying, so that as the paper leaves the roll the individual lands form solid spacers, preventing adjacent surfaces coming in contact with the ink. The spacing between the lands allows the ink to dry readily, and the anti-offsetting medium preferably is of such character as to be capable of being printed over in case of a multiple printing process, such as in color printing and the like. Also, the medium is preferably of such character as to be in a partially dry or tacky condition as it contacts the printed stock, so that it is readily deposited thereon and is practically dry as the paper stock progresses off of the roller.

Other objects and advantages of the present invention will be more apparent as this description proceeds, and reference is hereby made to the accompanying drawing, illustrating diagrammatically a preferred manner of carrying out the present invention, which, together with the specification, will disclose to those skilled in the art the particular construction and operation of the present invention.

Considering the process now in detail, it may be carried out by providing a tank or receptacle 5, of any desired construction, which is adapted to contain the anti-offsetting medium as indicated at 6. The tank 5 is preferably provided with the cover 7 in order to prevent evaporation of the medium, and the cover 7, on one side of the roller 8 which is journaled for rotation in the bearings 9 on opposite sides of the tank, is provided with an extended lip portion or scraper 10, which has scraping engagement with the surface of the roll 8, in order to remove excess liquid therefrom.

Any desired type of coating may be employed in the present process, and I may use a coating made from one or more of the following solids dissolved in appropriate solvents so as to get the requisite characteristics of application, drying, adhesiveness and the like: cellulose acetate, cellulose, nitro-cellulose, aceto-butyrate, and similar esters of cellulose, cellulose ethyls, including ethyl cellulose, benzyl cellulose, chlorinated rubber, as

well as other treated rubbers, synthetic resins of the alkid types, that is, combinations of glyceryl phthalates either with or without resin or fatty acid modifiers, also phenol resins either with or without fatty acid modifiers.

As a typical formula for use as an anti-offsetting medium, I may employ a liquid of the following composition by weight:

Six seconds nitro-cellulose (dry weight)	lb.	1
Dibutyl phthalate (liquid)	oz.	2
Liquid butyl acetate	oz.	26
Toluol	oz.	60
Ethyl acetate	oz.	40

As another typical formula for a coating medium of this type, I may employ the following:

Ethyl cellulose (approximately 48% ethoxy content)	lb.	1
Liquid toluol	oz.	78
Liquid ethyl alcohol SD 1	oz.	50

The specific viscosities of the nitro-cellulose or ethyl cellulose which might be employed in such formulae are not by any means critical, but are typical only. Other solid materials may be employed in the solution.

The liquids which may be employed for this purpose may comprise any solid or semi-solid substance which may be dissolved in a volatile solvent or a mixture of volatile solvents in the form of solution, but preferably restricted to essentially transparent solutions so as not to interfere with any image which may have been placed on the paper during the printing, lithographing, or other similar operations prior to the application of the anti-offset medium.

Obviously, wax or paraffine in the molten stage may be employed in connection with this process if desired, or other solutions such as set forth in my above mentioned copending application may be employed if desired.

Referring again to the diagrammatic illustration on the process, the roll **8** is provided in its lateral surface with a plurality of individual small depressions, or the surface may be corrugated. The depth of the depressions varies, depending upon the porosity of the paper which is to be run through the machine, while the spacing of the individual depressions may also vary. For example, in the application of this medium to newsprint, I find that probably thirty depressions to the linear inch will be sufficient, while on certain types of magazine stocks, perhaps as many as 200 to 300 depressions per linear inch may be required in order to deposit the proper amount of anti-offsetting medium.

The lip **10** of the cover for the reservoir **5** scrapes the surface of the roll as the roll is rotated about its axis, removing any excess medium which may be clinging to the surface of the roll, and the lacquer or other coating material is thereby retained in the bottom of each of the small depressions. This prevents the application of a continuous film of the lacquer or other offsetting medium to the paper, and also insures that the medium will be deposited on the paper in the form of individual spaced minute particles. Preferably the scraping knife or lip is made adjustable in order to vary the effective pressure thereof against the surface of the roll **8**.

A squeezing roller **12** is provided and is journaled for rotation in alignment with the roll **8**, whereby the paper or other stock is fed to the machine between the two rollers, and is firmly pressed against the surface of the roll **8** during this process.

The rollers **8** and **12** are driven in such manner that their surface speed will be synchronized with the speed of the device which feeds the paper therebetween.

Due to the evaporable nature of the solvent in which the cellulose or other solid or semi-solid medium is dissolved, as the roller **8** rotates away from the scraping surface **10** and into contact with the paper sheet **13** passing between the rolls **8** and **12**, a portion of the solvent evaporates, so that the material in the depressions of the roll **8** may be in a slightly tacky or adhesive condition, which will assist in transferring this material from the depressions in the roll **8** to the contacting surface of the sheet of stock **13**. As the stock passes between the rolling engagement between the rolls **8** and **12**, this medium is deposited on the sheet in the form of small individual particles or lands, which, immediately upon deposition, begin to harden due to the evaporation of the solvent carrying the same, and consequently as the sheet moves away from the rolls, these small globules or lands harden into individual spacers which serve to prevent the paper and other substances from contacting engagement which would produce rubbing against the ink which may not have dried on the paper. Thus, when sheets, such as the sheets **13**, are stacked or passed into folding and cutting rolls, the individual spacers will prevent rubbing of the freshly printed surfaces, and will thus protect the sheets against what is termed offset.

It is to be understood that regardless of the type of solution which is employed in the reservoir **5**, and which is contained in the small depressions in the surface of the roll **8**, the solution must have the characteristic of drying rather rapidly, if it is in the form of a solute dissolved in a volatile solvent, or of solidifying rapidly if it is in the form of a wax heated to a molten state. This is in order to insure that after the paper **13** has passed through the rolls, it will not require any considerable length of time before the individual solid spacers are formed, these being indicated at **14** on the sheet **13** after it passes through the rolls.

While the depressions may be formed in any desired manner on the roll **8**, such as by corrugating the roll or the like, I find that one manner in which this can be accomplished and which will produce excellent results is by engraving the surface of the roll to form the individual depressions which are generally indicated at **15** in the drawing.

It is obvious that other arrangements of the roll may be provided for applying the medium to the surface of the freshly printed stock, and that various types of reservoirs and scraping surfaces may be employed. Also, the paper may be passed through the rolls in the form of single sheets, instead of in the form of a continuous strip, or in any other manner as is usual in connection with the printing processes.

The medium employed should also have the characteristic of being capable of allowing the sheet to be reprinted, since in certain printing processes it is desired to accommodate such reprinting of the sheet, as for example in color printing, in which several different colors are successively printed on the sheet to form a colored design or the like.

I therefore do not intend to be limited to the exact means shown and described for carrying

out the present process, but only insofar as defined by the scope and spirit of the appended claims.

I claim:

1. The method of preventing offset which comprises providing a rolling surface having minute depressions therein, moving said surface through a substantially transparent solution comprising a cellulose derivate and an evaporable solvent, removing said solution from said surface while allowing minute globules thereof to remain in said depressions, exposing the globules to the atmosphere for a time sufficient to evaporate a portion of the solvent and bring the globules into a tacky condition, passing a printed sheet into contact with said surface, and simultaneously transferring the said globules to said sheet during said contact, the consistency and spacing of the globules being such that they remain discrete on the sheet.

2. The method of preventing offsetting of printed surfaces, which comprises printing upon a surface, forming separated globules of a substantially transparent volatile cellulosic solution arranged in predetermined spaced relation, exposing said globules to the atmosphere sufficiently to render them tacky, and applying said globules in their tacky condition to the printed surface while maintaining them in said predetermined spaced relation, thereby causing said globules to adhere to said surface in said spaced relation, the consistency of said globules when so applied to said surface being such that they remain discrete thereon in said spaced relation with the intervening areas of the printed surface exposed to atmosphere to facilitate drying of the printed surface.

3. The method of preventing offset which comprises; providing a rolling surface having minute depressions therein, moving said surface through a solution comprising a cellulose derivative and an evaporable solvent, removing said solution from said surface while allowing minute globules thereof to remain in said depressions, volatilizing enough of the solvent from the globules so as to bring the globules into a tacky condition, passing a sheet upon which offset is to be prevented into contact with said surface, and simultaneously transferring said globules to said sheet during said contact, the consistency and spacing of the globules being such that they remain discrete on the sheet.

4. The method of preventing offset which comprises; providing a rolling surface having minute depressions therein, moving said surface through a liquid capable of being formed into tacky globules, removing from the surface the excess of liquid which does not fill the said depressions, allowing the globules of liquid in said depressions to become tacky, passing a sheet upon which offset is to be prevented into contact with said surface and simultaneously transferring said globules to said sheet during said contact, the consistency and spacing of the globules being such that they remain discrete on the sheet.

5. The method of preventing offsetting of printing surfaces which comprises; printing upon a surface, forming in predetermined spaced relation separated globules of a solution of a cellulose derivative in a volatile solvent, removing sufficient solvent from said globules so that the globules assume a tacky condition and applying said globules in their tacky condition to the printed surface while maintaining them in said predetermined spaced relation, thereby causing said globules to adhere to said surface in said spaced relation, the consistency of said globules when so applied to said surface being such that they remain discrete thereon in said spaced relation with the intervening areas of the printed surface exposed to facilitate drying of the printed surface.

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