

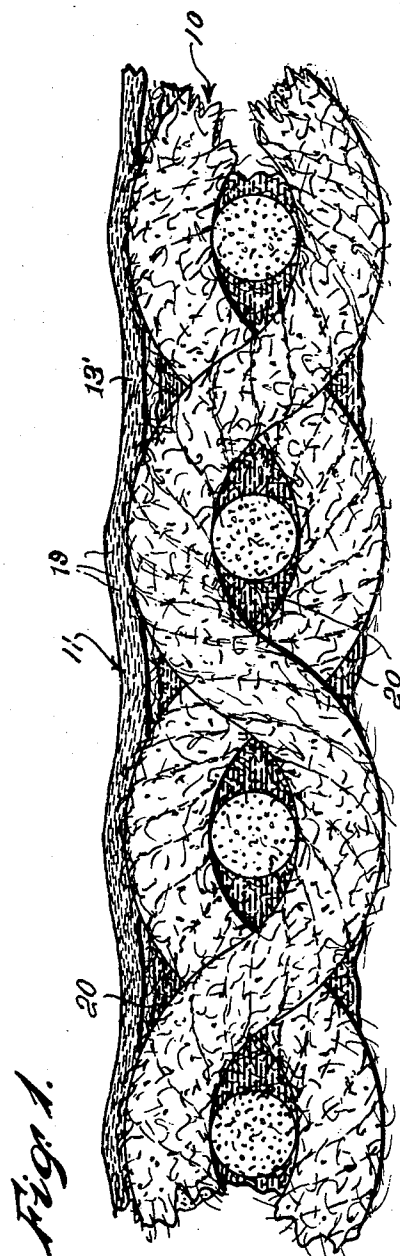
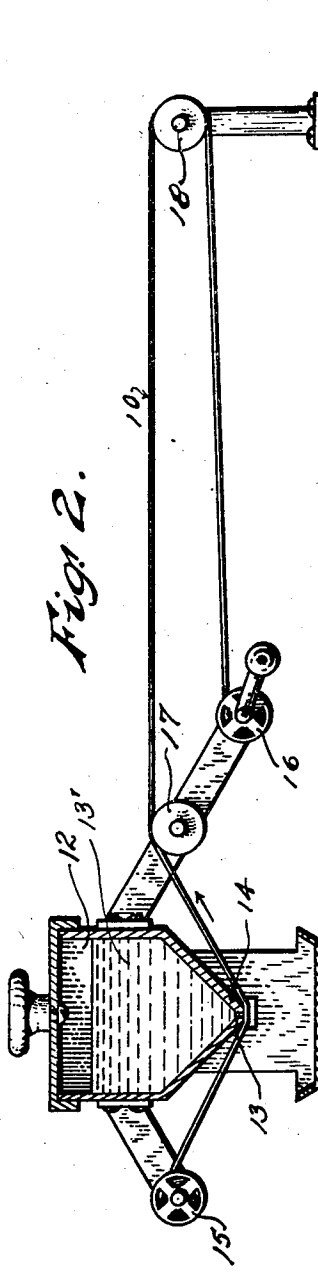
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TRANSFER ARTICLE

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TRANSFER ARTICLE

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The invention relates specially to improvements in typewriter ribbons modified to retard drying out of the ink or inking and soiling of the type, especially by the accumulation of lint thereon, as well as to enable typists to handle the ribbon without soiling their hands. It is also applicable to inking fabrics for other machines and purposes where similar ends are desirable.

It is an important object of the invention to enable the attainment of production of a ribbon having these advantages in a high degree while obviating many objections to prior attempts in this direction. Thus, it is an aim to enable the production of a shielding, sealing and protective coating including cellulose-like material on one side of the ribbon with the use of a much smaller quantity of such medium than has usually been required under prior practices to attain an equal effectiveness and durability for the several purposes in view. Another important object is to minimize the stiffening of the ribbon by such protective coating where a high degree of imperviousness with durability in that respect is attained.

It is a further object to enable the last mentioned improvement while at the same time avoiding use of materials which would have a deteriorating effect on the fabric of the ribbon, or on the ink therein, or on machine parts and containers.

An important aim is to reduce the tendency of the ink from the ink side of a ribbon to offset on to the shielded side by contact incident to the winding of the ribbon on the spools or reels on which they are customarily sold and used.

Incident to the production of a ribbon having the advantages above indicated, and others, it is an object of the invention to evolve a method of production by which an extremely thin metallic coating may be formed on a ribbon, using a minimum quantity of metal and of a carrying and binding medium. It is also an involved aim to embody a coating medium in which infinitely small metal particles are securely held in the dried medium with a minimum likelihood of being "beat out" and by which a metal layer may be formed on a ribbon having the necessary tenuity, continuity and strength. It is another object to enable the suspension of such fine metal particles in a medium of the general kind involved with great uniformity of distribution and with a minimum tendency of the metal to pack or gather in lumps or areas of unequal concentration. The result is also an adhesive capable of

general application besides its special value here involved, especially for use on glass.

Additional objects, advantages and features of invention reside in the steps, materials combined, and structures involved in the embodiment of the invention, as will be understood from the following description and accompanying drawing, wherein

Fig. 1 is an enlarged sectional view of the fabric and coating of my ribbon,

Fig. 2 is a diagrammatic view of apparatus for producing the coated ribbon.

There is illustrated in Fig. 1 a section of ribbon fabric 10, which may be produced in strips of proper width and length for use in various machines as heretofore practiced, and the fabric and impregnating ink may be of any approved kind available.

In my practice of the invention a stock ribbon, inked and ready for use in a typewriter in ordinary practice, is mounted in a reeling, coating and drying device of appropriate construction, in which an extremely thin shield or coating 11 of adhesive-protective material is applied to one side, the coating dried and the ribbon rewound on a spool with the coated side outward, when it is ready for packing, shipment, sale, and use.

This coating material is applied while in such a state of viscosity and adhesiveness, and in such quantity and with such speed of movement of the ribbon and drying of the ribbon, that the threads of the ribbon are not impregnated or penetrated, but only the projecting fibers and extreme outer surfaces of the threads coated and bound together: but the coating is extended with sufficient continuity for the purposes intended, without occupying the interstices of the ribbon most suited to holding ink. At the same time the shield is exceedingly diaphanous as compared to prior coatings of equal toughness or durability.

Coating apparatus heretofore known and used for analogous purposes may of course be adapted to use in producing ribbons embodying my invention, as will be understood from the following description of one possible apparatus and its manner of use in producing my ribbon. As a rule less extensive movement of the ribbon in driers is required with my invention, and the extent of prior drier structures may be materially reduced, with corresponding saving in investment and operating costs.

There is illustrated in Figure 2 a coating apparatus and system including a hopper 12, into which a liquid shield material 13' is introduced and maintained at a proper level to flow with uni-

formity from a discharge opening or slot in the bottom of the hopper. This slot 13 is extended transversely of the ribbon, and in practice has had a width of one-sixteenth of an inch longitudinally of the ribbon, and a length of approximately half an inch transversely of the ribbon being coated, when the ribbon is a half inch wide. The downwardly presented nozzle 14 of the hopper is also extremely narrow on its lower face beside the slot in the direction of departure of the ribbon, so that there is a minimum of surface to move upon the ribbon after application of the coating, and a minimum tendency to press the applied material into the ribbon.

The new and uncoated ribbon is carried upon a supply spool 15 which may be of any suitable tensioned type adapted to keep the ribbon under proper tension as it is drawn from the spool across the under side of the nozzle 14 to a winding reel 16 located at a suitable distance to permit sufficient drying of the applied coating before the ribbon is rewound. To properly hold the ribbon against the nozzle 14, the reel 15 is located so that the ribbon extends downwardly to the nozzle, and after passing the nozzle, it is carried over an idler roll 17 at a level above the nozzle. The coated ribbon may be passed over one or more idler rolls 18 permitting the winding reel to be located closely adjacent the hopper, where the same person attending the hopper and placing of new rolls may also tend the reel 16.

The formula by which the shield material is produced is such that winding the ribbon at the rate of about five inches per second, it will dry sufficiently for rewinding after a travel of about six feet in the open air at summer temperatures. It is rewound in such direction that the coated side of the ribbon is the outer side of the ribbon on the spool.

The shielding material includes a substantial quantity of metal such as very fine aluminum powder, which, by the overlapping of the minute flake-like particles 19, forms a substantially continuous metal layer on the ribbon, through which the volatile elements of the ink of the ribbon cannot penetrate or evaporate. The ribbon is thereby virtually sealed at its outer face, without requiring the use of tin foil or other metal foil as a wrapper, as is the common practice, but may be packaged in the customary metal boxes which the goods are retailed in and which serve to protect the carrying spool from damage, or they may be packed in other containers without the individual foil wrappings, the metal in the ribbon coating, in conjunction with the sides of the reel or spool, being an equivalent closure.

In order to attain the proper viscosity of the coating for the processing described, to attain the necessary uniformity of distribution of the metal in the fluid shield material, and to assure the required adhesiveness—both of the coating to the ribbon and of the body medium of the shield material to the metal particles suspended therein—after drying, the following formula has been employed:

By weight:	Per cent
Celluloid, clear, shreds-----	7.52
Acetone, C. P. (dimethyl ketone)-----	76.50
Aluminum, finest powder-----	.82
Spirits of camphor (10% pure gum	
camphor in 95% alcohol)-----	14.97
Rosin, powdered, amber clear-----	19

The Celluloid is mixed with a part of the acetone until a very thick lumpless lac is obtained. The rosin is dissolved in the remaining acetone,

and to this mixture of acetone and rosin the aluminum is added. This second mixture is highly fluid, the rosin causing the aluminum to remain well in suspension in this preliminary mixture, and in the final product increasing the adhesion of the body of the medium to the aluminum, and increasing the viscosity and surface tension of the mixture while fluid. This second mixture is now added slowly with constant stirring to the heavy lac formed as above. Finally the camphorated spirit (prepared according to the U. S. P. or the National Formulary) is stirred into the main body of the mixture, this serving to increase the gum value of the product and flexibility of the finished dry product as well as causing better suspension of the aluminum and improving the flowing quality and adhesiveness of the coating. The Celluloid affords high flexibility and toughness in the body of the medium when dry.

After the complete mixture of the ingredients as described, it is important to allow the product to stand for a time before use, and it should of course be securely enclosed to reduce loss of volatile elements.

The shield material applied as described, using the product of the formula given, results in an extremely diaphanous film on the surface of the ribbon with the metal uniformly distributed throughout, and giving the coated side of the ribbon a steel color.

When a ribbon so produced is stored, especially in a spool with closed sides, it preserves its freshness over a very long period, even without being wrapped in foil. The ink 20 retains its color unaffected by the shield material, and the fabric is also preserved without detriment after long standing.

In the handling of the ribbon by the user, contact with the ink of the ribbon may be avoided by folding the ribbon to form loops with the inked face at the inner side, and grasping the ribbon with the fingers at the outer sides of the loops, whereby only the coated side is touched.

I am aware that viscous coatings have been applied to such inking fabrics with the purpose of sealing one side, but these have the objections before enumerated, and where a single application is employed to produce an adequate shield, it results in excessive impregnation of the fabric so as to limit the ink holding and feeding capacity and flexibility thereof, and also does not form as effective a seal against evaporation as I attain by a very thin application. A ribbon lacking flexibility will produce heavy face characters, where a properly flexible ribbon will produce fine lines.

The inclusion of the camphor and the aluminum produces a certain degree of ink-repellant effect, limiting the tendency of ink to offset from the paper side of the ribbon to the type side thereof while wound on the spool.

The metal content reduces the tendency of the shield to become disrupted by blows of the type in typewriters, so that the permeation of the shield by the ink and evaporation through the shield is minimized in a large degree.

In the product the metal particles afford a positive bar to the passage of ink or its volatile elements, although the Celluloid would also be similarly effective in a much less degree for a given thickness. There is required only a small amount of the Celluloid and gum content of the body of the shield to hold the metal particles in place, and consequently the quantity of the viscous material is greatly reduced as compared to prior

practices where the latter was solely depended upon for the various qualities.

Other metals than aluminum may also be used in the shield material with good effect, especially bronze powder, which is possibly tougher than aluminum, but aluminum is preferred because of its lightness, freedom from liability of corrosion, and its susceptibility to very fine subdivision, as well as its capability of remaining in suspension for long periods in such solutions as indicated. The quantity of aluminum may be varied to some extent, but is believed best kept below two per cent by weight of the aggregate of the shield material, and the specific formula given has been practiced with the best result up to this time.

Since the solvent will evaporate rapidly, and the camphor also to a considerable extent, although the latter will be largely retained by enclosure in the shield material, the composition of the shield material on the ribbon as finally marketed will be approximately as follows when the specific formula for the coating as given above is used, by weight:

	Per cent
Celluloid.....	88.00
Aluminum powder.....	9.60
Rosin.....	2.30
Camphor	0.10

Final evaporation of the camphor will make an immaterial effect, as may be understood from the statement of its purpose in the coating material.

I claim:

1. As a new article of manufacture a type-writer ribbon comprising a fibrous foundation having on one side a transfer material for transferring visible impressions under pressure, and having on its other side a shield material consisting of a non-absorbent cementitious material and a suspension therein of fine metal particles.

2. The structure of claim 1 wherein the said shield consists of, by weight, Celluloid 7.52%; acetone 76.50%; aluminum powder 0.82%; spirits of camphor 10% solution, 14.97%; rosin 0.19%; applied as an extremely attenuated coating attached by adhesion only to the extreme surface fibers of the fabric.

3. The structure of claim 1 in which the said shield includes by weight, cellulose-like material 88 per cent; aluminum powder 9.5 per cent.

4. The structure of claim 1 in which the said shield consists of, by weight: cellulose-like material, approximately 88 per cent; aluminum powder, approximately 9.6 per cent; rosin, approximately 2.3 per cent; camphor, approximately 0.1 per cent.

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