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(54) **Apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like.**

(57) The invention is concerned with an apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, which comprises a dispenser (1) in communication with a storage tank (3) of a liquid substance to be dispensed, and being connected to an electrostatic generator (4) for delivering said liquid substance in the form of atomized and electrified particles. A peculiar feature of the invention is that it comprises, facing said dispenser and spaced apart therefrom, a grounded electrically conductive surface (10) adapted to function as a supporting element for a sheet-like element (20, 30) which is being evenly applied with said atomized and electrified particles.

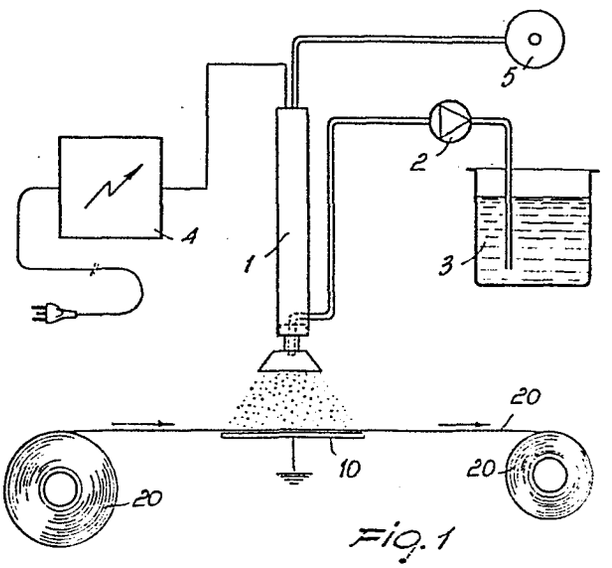


Fig. 1

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"APPARATUS FOR APPLYING LIQUID SUBSTANCES OVER SHEET-LIKE ELEMENTS, SUCH AS CLOTHS, HIDES, AND THE LIKE"

This invention relates to an apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like.

As is known, such liquid substances as paints, water-dispersed liquid adhesives, etc. are conventionally applied over textile, hide, and the like substrates by means of air or airless spraying devices which utilize in practice guns or nozzles driven reciprocatingly or carousel-fashion across a travel path of the sheet-like element whereon the product is to be spread evenly distributed over its surface.

Such prior apparatus pose, in use, some important problems, especially as relates to the overlap areas between application bands to be obtained with traditional spray gun arrangements.

Furthermore, problems of product waste and complex construction are encountered when trying to provide an even movement of the guns or nozzles.

In other industrial fields where the element whereon the liquid substance, generally paint, is formed from a conductive metal material, it is known to apply coating products, which may be water soluble in nature, by means of rotary bell or cone or centrifugal electrostatic atomizer apparatus.

The coating product is caused to flow into a bell or cone rotated at a high speed and subjected to a high electrostatic potential by some suitable means. Under the combined effects of centrifugal force and of the

electrostatic field, the coating product or the like is atomized into very fine electrified particles which deposit themselves over any electrically conductive ground-connected objects which happen to be in front of the atomizer.

With such application arrangements, the waste of product into the environment is almost nil, and a uniform application of the coating material can be ensured.

However, the above electrostatic process can only be employed with conductive metal products, and its field of application cannot be extended to the painting of products which are not electrically conductive, such as cloth, hide, and the like.

This invention is directed to provide an apparatus which can allow application of such liquid substances as adhesives, paints, etc. by an electrostatic process over sheet elements which are not inherently electrically conductive.

Within the above general aim, it is an object of this invention to provide an apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, which affords all of the advantages inherent to electrostatic painting processes even if the liquid substance is not applied to an electrically conductive element, while affording continuous application capabilities, i.e. application over an element which is caused to move continuously under the apparatus.

A further object of the invention is to provide

an apparatus which, owing to its peculiar construction, can give full assurance of being reliable and safe to use.

It is another object of this invention to provide an apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, which can be readily formed from commercially available items and be highly advantageous from a purely economical standpoint.

According to one aspect of the invention, the above task and objects, as well as yet other objects, such as will be apparent hereinafter, are achieved by an apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, comprising a dispenser in communication with a storage tank containing a liquid substance to be dispensed and being connected to an electrostatic generator for delivering said liquid substance in the form of atomized and electrified particles, characterised in that it comprises, facing said dispenser at a distance therefrom, an electrically grounded conductive surface adapted to serve as a backing element for a sheet-like element whereon said atomized electrified particles are spread evenly.

Further features and advantages will be more clearly understood from the following description of a preferred, though not exclusive, embodiment of an apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, according to the invention, with reference to the accompanying illustrative drawing , where:

Figure 1 shows schematically this apparatus for applying liquid substances over a cloth or fabric material kept running continuously; and

Figure 2 shows schematically this apparatus for applying liquid paint or the like substances over hide or other sheet elements not running continuously.

Making reference to the drawing views, an apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, according to this invention, comprises a dispenser 1 of a type known per se, which may comprise a rotary bell or cone atomizer, an electrostatic gun, a spray nozzle issuing a blade or band of the product or the like,and which is in communication, with the interposition of a feed pump 2, with a storage tank 3 containing a liquid substance to be supplied, which liquid substance may comprise water-dispersed liquid adhesives, paints, etc. The dispenser 1 is electrically connected to an electrostatic generator 4, of a type known per se, which is adapted to allow the dispenser, as connected to a compressed air supply 5, to deliver atomized and electrified particles, a peculiar aspect of the invention residing in that, arranged to face the dispenser outlet end, is a preferably flat conductive surface 10 electrically grounded.

The surface 10 serves as a backing member for a sheet element to be painted, which would be practically placed between the conductive surface 10 and dispenser 1.

In the embodiment shown in Figure 1, wherein the

sheet element comprises a cloth material 20 extending continuously between a supply coil and receiving coil, the cloth in moving past the surface 10 behaves in practice as an electrically conductive element in view of the high voltages (30-100 kV) involved.

Thus, an even distribution of the liquid substance over the cloth is achieved, and hence an application thereof that results in no waste.

It should also be noted that it is possible to provide, in accordance with individual embodying requirements, one or more rotary bell electrostatic atomizing units suitably arranged above the cloth 20 or sheet element whereon the liquid substance is to be applied.

Where the sheet elements do not extend continuously, as is the case with, for example, hides and the like, indicated at 30, a conveyor belt or carpet 40 is provided which runs continuously with one portion of its upper run located above the cited conductive surface 10. The belt or carpet 40 serves, in turn, as a supporting element for the sheet elements, which may comprise hides or the like, to establish a similar situation to the former, since owing to the small thickness involved versus the high voltages used, the sheet elements, such as hides and the like, while not being inherently conductive materials, can actually behave as such on account of the conductive metal surface 10 underlying them.

In a highly advantageous embodiment of the invention for use with products which do not extend

continuously, such as hides or the like, an apparatus may be employed which can detect the outlines of the oncoming pieces to only ground those areas of the conductive surface 10 which are affected by the piece; in this case, the conductive surface comprises conductive surface portions laid side-by-side and electrically insulated from one another which can be selectively connected to ground.

Such apparatus may comprise an optical or electric eye bar (not shown) having a light sensitive portion (optometric sensors) and a light (neon) source which can detect, on the basis of the blotted out optometric sensors, the outline of a piece moving past it, to transmit the information to an electronic unit for storing information from the bar. The electronic unit controls, in accordance with the carpet advancement, which portions of the conductive surface are destined to be located under the piece and their grounding, to leave the remnant at a floating potential.

A carpet timing assembly can be also provided (not shown) comprising a gear wheel and a proximity sensor operative to supply a signal at each forward unit movement of the carpet and appropriately drive the electronic unit.

It may be appreciated from the foregoing description that the invention achieves its objects, and in particular the fact should be emphasized that the apparatus of this invention, by utilising said conductive metal surface 10 both as a backing element and ground connection element, enables liquid

substances to be applied over elements inherently non-conductive with the same techniques as are currently employed for the application of paints and the like over electrically conductive materials and parts.

Furthermore, an added important object of the invention is that liquid substances can be applied over non-conductive sheet elements to provide a uniform distribution of the product across the element, while product waste can be significantly reduced owing to the product being solely spread over the areas affected by the elements.

The invention as disclosed is susceptible to many modifications and changes without departing from the purview of the instant inventive concept.

Thus, as an example, the supporting carpet for the sheet element to be painted may be formed from a material made electrically conductive by means of wires or a mesh, or the like, which would be grounded electrically, thereby the conductive plate 10 may be omitted altogether.

All of the details, moreover, may be replaced with other, technically equivalent, elements.

In practicing the invention, the materials used, as well as the dimensions and contingent shapes, may be any suitable ones to fill individual requirements.

CLAIMS

1. An apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, comprising a dispenser in communication with a storage tank containing a liquid substance to be dispensed and being connected to an electrostatic generator for delivering said liquid substance in the form of atomized and electrified particles, characterized in that it comprises, facing said dispenser (1) at a distance therefrom, an electrically grounded conductive surface (10) adapted to serve as a backing element for a sheet-like element (20) whereon said atomized electrified particles are spread evenly.

2. An apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, according to Claim 1, characterized in that said sheet-like element (20) is placed between said backing element (10) and said dispenser (1).

3. An apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, according to the preceding claims, characterized in that said sheet-like element (20) is kept moving continuously relatively to said backing element (10).

4. An apparatus for applying liquid substances over sheet-like elements, such as cloths, hides and the like, according to one or more of the preceding claims, characterized in that continuously running sheet-like elements (20) are supported directly on said conductive surface (10).

5. An apparatus for applying liquid substances

over sheet-like elements, such as cloths, hides, and the like, according to one or more of the preceding claims, characterized in that, with discontinuous sheet-like elements (30), a conveyor belt or carpet (40) is provided which extends continuously and has at least one portion of the active run thereof extending above said conductive surface (10), said sheet-like elements (30) being laid onto said carpet (40).

6. An apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, according to one or more of the preceding claims, characterized in that said conductive surface (10) comprises a plurality of conductive surface portions laid side-by-side and electrically insulated from one another, said conductive surface portions being selectively connectable to ground on discontinuous or discrete sheet-like elements (30) moving past by an electronic unit driven by an optical bar operative to detect the outlines of said discrete sheet-like elements.

7. An apparatus for applying liquid substances over sheet-like elements, such as cloths, hides, and the like, according to one or more of the preceding claims, characterized in that it comprises a supporting carpet formed from an electrically conductive material electrically grounded.

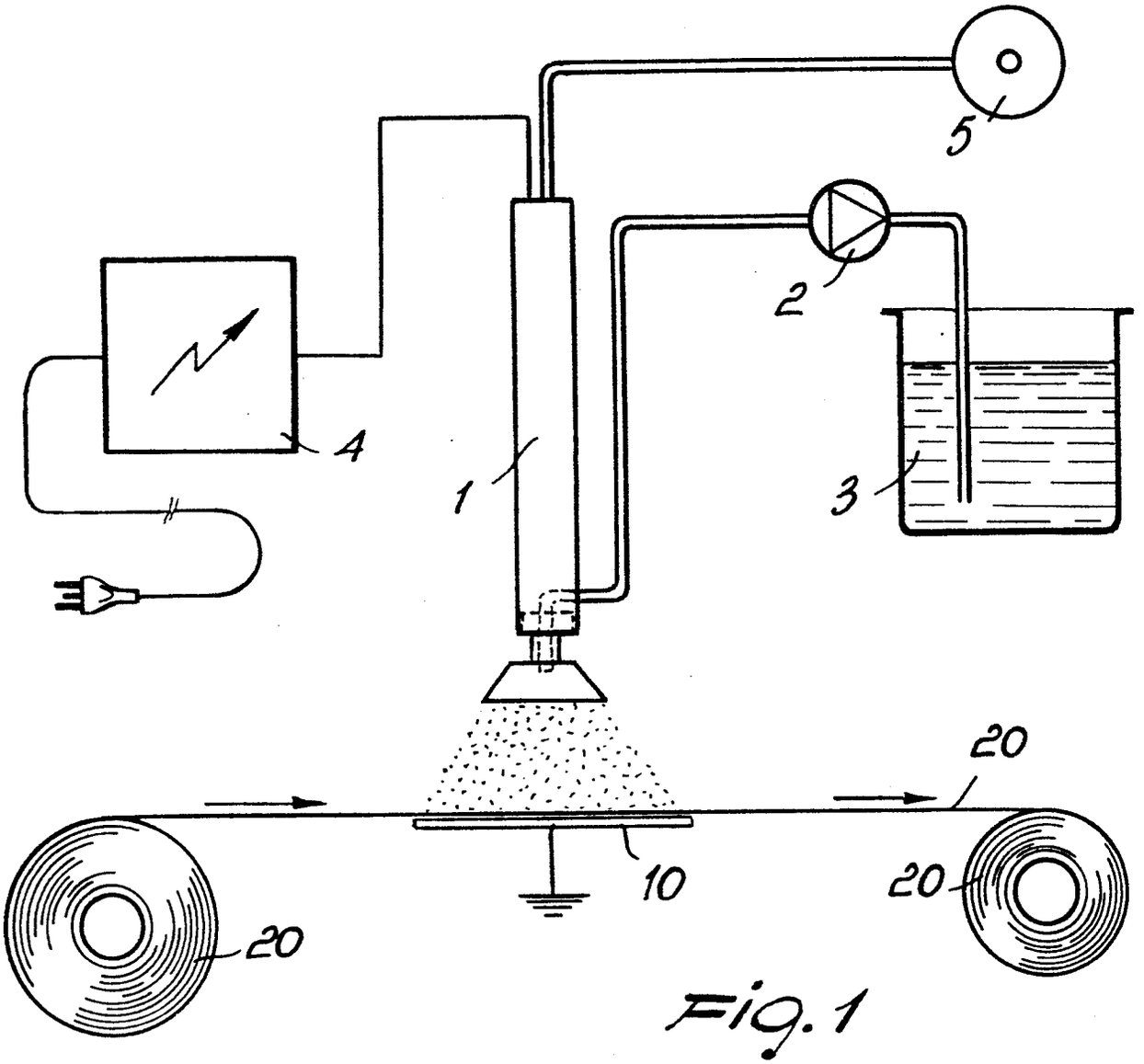


Fig. 1

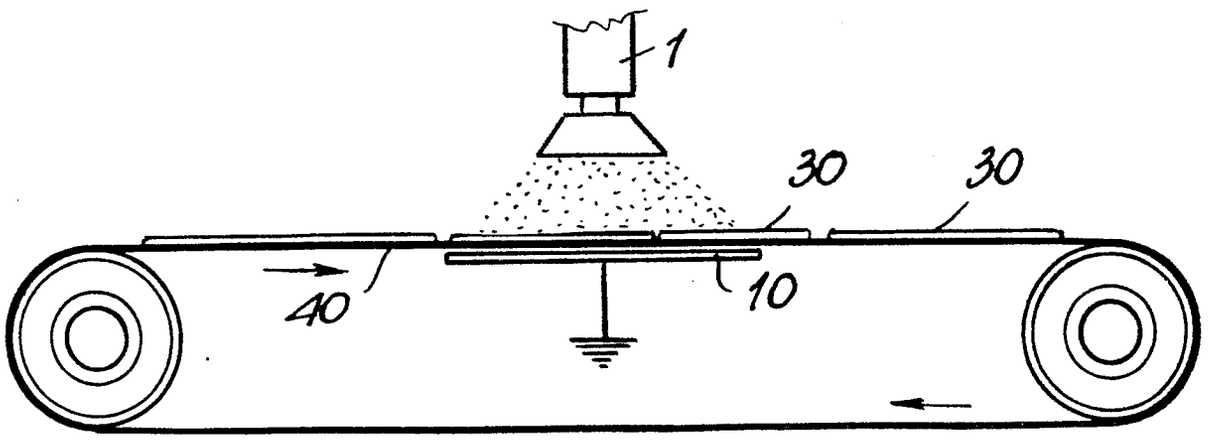


Fig. 2

European Patent Office

EUROPEAN SEARCH REPORT

0131182
Application number

EP 84107009.7

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	DE - A1 - 2 546 025 (RÖTH + CO) * Claims; fig. 1 * --	1,2,3	B 05 B 5/02 B 05 B 5/00
X	DE - A - 1 646 093 (SCOTT PAPER) * Claims; fig. * --	1,2,3	
A	FR - A - 2 033 180 (SOCIETE NOUVELLE FLOCKAGE) * Claims * ----	1,2,3	

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)

B 05 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	14-09-1984	SCHÜTZ

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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