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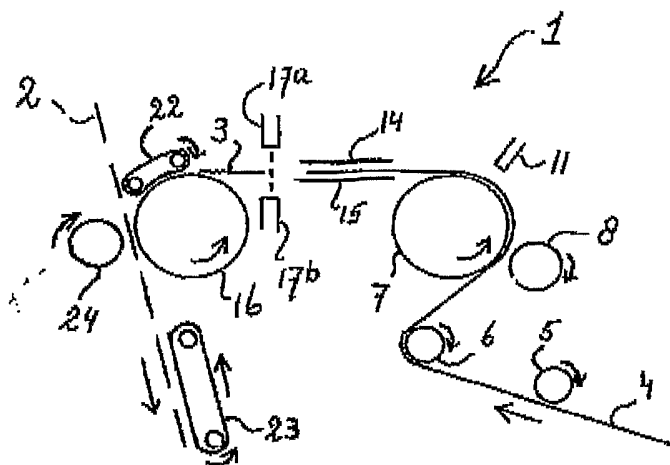
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(54) Title: METHOD AND DEVICE FOR APPLYING OBJECTS TO PRINTED MATTER



(57) Abstract: in a method and device for applying objects to pages of printed matter, strip of material (2) is advanced. The strip of material comprises a number of repeating strip lengths, each strip length defining at least one page of the printed matter. An object (18) is joined to each repeating strip length of the strip of material by providing a web (4) of cards (3), with an object secured to each card of the web of cards, separating each card from the web of cards and joining each card to a repeating strip length of the strip of material.

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## Method and device for applying objects to printed matter

There has long been a desire for an object, such as a sachet, to be secured to a page in a piece of printed matter, such as a newspaper, leaflet or magazine. Hitherto, objects of this type have for this purpose been stuck manually or by machine onto the page in loose-leaf form, or if appropriate when the pages have already been combined to form the printed matter.

In addition, it has long been known to apply cards of paper or thin cardboard automatically to a strip of paper moving through a rotary printing installation with the aid of a card-sticking machine before the strip of paper is divided into separate sheets (cf. for example US-A 4,351,517 ("Neal"), US-A 5,968,307 ("Siler") and EP-A 0 949 178 ("Siler")). For this purpose, a web of cards, comprising a large number of cards, which are positioned one behind the other in a longitudinal direction, are made from single-layer paper and are successively separated from the said web of cards one by one in the card-sticking machine, in order each to be secured to a subsequent, repeating strip length, which forms a page and is advanced by the (rotary) printing installation or the like (for example intaglio, offset, heat-offset or cold-offset), is fed to a card-sticking machine of this type. Partly on account of the particularly high operating speed (80,000 or more cards per hour), the cards are attached to one another by means of a tearable perforation or other weakened line in the web of cards, in which case the cards can easily, quickly and reliably be separated from one another in a handling device of the card-sticking machine by being torn off one another. If a tearable perforation or other weakened line is not present, the cards may also, as an alternative, be separated from one another by being cut off one another with the aid of a cutting device.

Identical information, images and the like can have been applied to the repeating strip length, but this is not a prerequisite. Rather, the term repeating strip length is to be understood as meaning that the strip is intended subsequently to be divided into separate leaves/sheets/pages.

As is known, the card-sticking machine includes a feed device having a drum and/or one or more rolls (referred to below as register drum for short), over which the web of cards is guided (preferably substantially without any slippage). The rotational speed of the register drum is controlled by a control device of the card-sticking machine in order to allow the advance of the web of cards of the card-sticking machine to be synchronized with the advance rate of the repeating strip length moving past, so that each card is applied to substantially the same place on the repeating strip length. It will be clear that the control device of the card-sticking machine will generally set the circumferential velocity of this register drum and therefore the speed at which the web of cards is supplied to the card-sticking machine to be considerably lower than the rate of advance of the repeating strip length moving past, since the card length is shorter than the repeating strip length in the respective conveying directions. More details of this synchronization and/or maintaining of a phase relationship between the web of cards and the repeating strip length are found in EP-A 0 949 178 (in particular Figs. 7 and 8 and associated description) or in the publicly available manual for the card-sticking machine marketed by Hurletron, Inc. of Danville, Illinois, USA, type Electrocard, model 763, dated 4 May 1992. The register drum may be designed with register means, such as radial projections (pins) on its surface in order to drive the web of cards, or the register drum may move the web of cards on the basis of friction, in which case means are provided for pressing the web of cards onto the register drum.

A characteristic feature in this context is that only a small part of the surface area of the cards is generally fixed to the repeating strip length, usually less than 50% of the surface area, or even less than 25% or less than approximately 10% of their surface area. A hotmelt adhesive, which is applied to the cards in the card-sticking machine by means of a metering nozzle mounted therein, generally, although not necessarily, before the cards are separated from one another, is generally used to secure the cards to the repeating strip length. The cards are

often secured by adhesive at one longitudinal side edge, so that at a later stage they can easily be removed from the printed product of which the repeating strip length forms part. However, it is also possible for the card to be secured to the strip at different positions in its longitudinal and transverse directions, so that the card is reliably able to remain lying flat on the repeating strip length.

The cards are generally rectangular, elongate and smaller than A4 or A5 format (for example approximately 14 cm long).

The proposal is now for objects other than the conventional cards to be automatically secured to the page at the time at which the page forms part of a strip of material which contains a large number of pages in succession in the longitudinal direction. In this way, the object can be applied using a card-sticking machine. The object is then placed onto the strip of material after it has passed through one or more stations in the printing installation in which an image, text or the like is applied, for example using printing ink, and before this strip of material is divided into the separate sheets/pages. If the strip of material passes through a drying chamber or the like associated with the printing installation, it is preferable for the object to be applied by the card-sticking machine after the strip of material has passed through this drying chamber.

In the case of objects made from materials other than paper or relatively thin solid cardboard, such as sachets, but also plastic cards for use as, for example credit cards, membership cards, etc., it has not proven possible for them to be supplied to a known card-sticking machine in the form of a continuous web in order then to be divided up into individual objects while at the same time complying with the desired high operating speed. Tests have shown that objects of this type are unsuitable for tearing apart in the card-sticking machine, even if a tearable perforation or other weakening is provided at the location where it is desired for them to be torn.

To enable objects of this type still to be processed using a card-sticking machine, it is proposed for objects of this type, secured to a web of cards, to be fed to the card-sticking machine, with the web of cards being divided, in the card-sticking machine, into separate cards which each bear an object, after which the separate cards, each bearing an object, are applied by the card-sticking machine to a passing strip which is guided through a printing press or similar machine for the production of a printed product by a successive series of (substantially) identical images being applied to a strip of material. This means that objects of this type are already separate from one another when they are fed to the card-sticking machine, which is possible on account of the fact that the objects are applied to a web of cards which is suitable for processing by the card-sticking machine. Therefore, in principle there is no need for any physical modification to the existing card-sticking machine.

It will be clear that in the present context the term object is to be understood as meaning any conceivable object which can be applied to a card in order subsequently to be separated therefrom, i.e. not just the abovementioned cards or sachets, but also, for example, a piece of paper or film or foil. In particular, these are objects which are unsuitable to be fed to the card-sticking machine in the form of a continuous web of such objects which are fixed to one another via a weakened line in order to be torn off one another in the card-sticking machine before being separately applied to a passing strip.

The invention also relates to a continuous web of cards, which are preferably secured to one another via a weakened line (tearable perforation) and are preferably made from flexible material, such as paper or (thin) solid cardboard or plastic film, preferably packaged in a container in at least one or a large number of "fan-folded" stacks next to and/or adjacent to one another, which container packaging is disclosed, for example, in EP-A 0 441 136 or EP-A 0 763 491, both incorporated by reference in the present application, the said continuous web being suitable for processing by a card-sticking machine in a

(rotary) printing installation. A (preferably relatively flat/thin) object is applied to the cards in the continuous web and can be removed from the card, for example a sachet (for example filled with powder, lotion, crème, liquid), a (substantially inflexible) plastic card, so that the object can be distributed by being automatically applied in a printed product with the aid of the card, which printed product is distributed in the customary way. In this context, it will be clear that the form of the object is such that it does not significantly affect the appearance of the printed product (for example preferably does not significantly thicken the printed product, which, for example, would impede standard distribution). Moreover, it is also conceivable for the cards belonging to the continuous web of cards to have similar cards applied to them, for example made from paper, (thin) solid cardboard, (plastic) film and the like.

The objects can be secured to the cards in any desired way, for example by adhesive or a rivet. It is preferable for the size of the object to be such and/or for the object to be applied to a card such that the object does not project beyond the longitudinal and side edges of the card, and more preferably remains at a distance therefrom.

The invention is explained in more detail below with reference to a currently advantageous exemplary embodiment which is shown in the drawing and of which it will be clear that it is not intended to restrict the scope of the invention.

Fig. 1 shows a side view of the most important components of a card-sticking machine.

Fig. 2 shows part of a web of cards in plan view.

Fig. 3 shows part of a web of cards in side view and on a larger scale.

Fig. 4 diagrammatically depicts a side view of a stack of cards.

Fig. 5 shows a side view of a stack of cards on a pallet.

Fig. 6 shows a plan view of the stack of cards of Fig. 5.

Fig. 7 shows a detail of the stack of cards of Fig. 5 in a perspective view.

The card-sticking machine 1 illustrated is incorporated in a rotary printing installation (not shown; for example for intaglio printing, offset or cold-set) for printing newspapers, magazines or the like, at a location which is such that the strip of paper 2 which has been unwound from a stock reel and printed by printing rolls passes through the machine 1 in accordance with the dashed line and in the direction indicated by the arrow, on its way to downstream cutting, binding and finishing stations. On arrival at the machine 1, the strip 2 has already been printed with print which is repeated at a predetermined repeat length, this repeat length corresponding to a page or an integer multiple of pages of printed matter. Also (optionally preprinted) cards 3 are fed to the card-sticking machine 1 in the form of a single row of cards 3 which has been formed into a continuous web 4 (cf. Fig. 2) which advances in the direction indicated by the arrow. In this web 4, the cards 3 are secured to one another by a tearable perforation 10. The cards 3 also include a tearable perforation 20 (which may optionally be absent) parallel to and at a short distance from a longitudinal edge 21 of the web 4. In the machine 1, in each case the front card 3 in the web 4 is pulled off along the tearable perforation after adhesive has been applied to this card 4, after which this card 4 is stuck to the strip 2. This sticking is carried out in such a manner that a card 4 is stuck to at least substantially the same location on each repeat length of the strip 2 (cf. for example Fig. 2 of EP-A 0 949 178).

The cards 3 or the web 4 may be provided with a series of register holes 9 (cf. Fig. 2) parallel to the longitudinal edge 21, but these register holes may also be absent.

The web 4, which is supplied from a stock (not shown), passes over freely rotating guide rolls 5 and 6 and then passes into the nip between a rotating, driven drive drum 7 and a pressure-exerting roll 8, so that the web is frictionally locked to the drive drum 7 and as a result is pulled out of the stock. Two metering nozzles 11 then apply adhesive to the web 4 which is carried along with the drive drum 7. One metering nozzle 11 only meters adhesive for a short time per card 3, so that a small spot of glue 12 is applied close to a corner of the card 3 (cf. Fig. 2). The other metering nozzle 11 applies a continuous or interrupted strip of glue 13 in the region between the longitudinal edge 21 and perforation line 20 (i.e. at a distance from the spot 12; cf. Fig. 2). The strip of glue 13 is in each case interrupted at the tearable perforation 10, so that there are no strings of glue formed when the cards 3 are being detached from one another. It will be clear that in the view shown in Fig. 1 the nozzles 11 are located one behind the other, and consequently only one is visible. Moreover, it will be clear that they maintain a space between them which at least substantially corresponds to the space a shown in Fig. 2. Other locations for the nozzles 11 are also conceivable, optionally aligned in the transverse direction of the web 3.

The web 4 then moves through the gap between guide plates 14, 15 located one above the other and then passes into the nip between a rotating, driven discharge drum 16 and a co-rotating conveyor belt 22 which presses the web 4 onto the drum 16 over a radial circumferential part thereof (for example at least  $10^\circ$ ), so that the web 4 is frictionally locked to the discharge drum 16. The speed of the circumferential surface of the discharge drum 16 is in this case set to be higher than that of the circumferential surface of the drive drum 7, and it is also ensured that there is no slip or scarcely any slip between web 4 and drive drum 7 or discharge drum 16 (at most 0.1 mm, preferably at most 0.02 mm, most preferably at most 0.01 mm of slip for one or both drums 7, 16), so that the web is pulled strongly in the section between the drums 7, 16, so that it yields at a tearable perforation, with the result that the front card 3 is separated from the web 4 in the region between the drums 7, 16. If they



are suitably shaped, the guide plates 14, 15 can ensure a local increase in stresses in the web 4 in order to help the tearable perforation 10 to yield. In this context, it will be clear that the free length of the web 4 between the drums 7, 16 is at most double the length of the card.

In this embodiment, the drum 7 does not have any register pins or the like, which are intended to interact in a positively locking manner with the cards 3, for example by fitting through the register holes 9, projecting out of its circumferential surface. In an alternative embodiment, however, the drum may be provided with register means of this type. In this case, these register means on web 4 and drum 7 prevent slippage between drum 7 and web 4, and consequently the frictional lock between web 4 and drum 7, which is generated by the pressure-exerting roll 8, in order to prevent this slip, does not play any role, and consequently this roll 8 can be omitted in this embodiment. The pressure-exerting roll 8 may if appropriate be replaced by another (pressure-exerting) means in order to ensure at least substantially slip-free frictional lock between drum 7 and web 4, for example a pressure-exerting belt which is similar to belt 22 and maintains a constant gap width over a radial part (for example at least 10°) of the drum circumference. The belt 22 may if appropriate also be replaced by another (pressure-exerting) means in order to ensure at least substantially slip-free frictional lock between drum 16 and card 3, such as a pressure-exerting roll which is similar to pressure-exerting roll 8.

To synchronize the advance of a card 3 and the strip 2, in order for the card 3 always to be secured to the correct location on a repeating strip length, the machine 1 includes, between the drums 7, 16, a detector 17 which comprises a light sensor 17a and a light beam generator 17b, the light beam from generator 17b being interrupted by a passing card 3, which is recorded by the sensor 17a. It is in this way possible to reliably determine, inter alia, the position between the drums 7, 16 of the front edge of the first card 3 of the web 4. The detector 17 also counts the number of cards 3 and controls the metering from the nozzles 11.

While the separated card 3 is being advanced by the drum 16 on its outer circumference, the glued side of the card 3 comes into contact with the strip 2 which is being advanced through the nip between the drum 16 and an freely rotating pressure-exerting roll 24, is stuck fixedly to this strip 2 and then leaves the machine 1 together with the repeating strip part. On account of the fact that the card 3 is stuck to the strip 2 by the spot 12 and the strip of glue 13, the card 3 will reliably continue to lie flat on the strip 2 and will not project up from it.

The machine 1 is controlled in such a manner that the circumferential surface of the drum 16 moves at the same speed as the strip 2. For this purpose, the control unit receives information concerning the speed of the strip 2 from the printing press, and the control unit matches the speed of the drum 16 to this speed. The speed of the circumferential surface of the drum 7 is controlled by the control unit as a function of the position of the card 3 detected by the detector 17, in order to ensure that the card 3 reaches the correct location on the strip 2. It will be clear that the variation in speed of the drum 7 for this synchronization is relatively minor with respect to the mean speed of this drum 7, for example amounting to at most 20% thereof.

As shown in Figs. 2 and 3, an object 18 is applied to each card 3. It will be clear that the object 18 covers only part of the surface of the card 3. It is preferable for the object 18 to be located on that side of the card which faces away from the glued side of the card.

The object 18 will generally be considerably more flexurally rigid than the card 3 to which it is secured. To ensure that the object 18 on the card 3 is advanced without problems, it is preferably for the object 18 to be secured to the card 3 in such a manner that at least its front edge (i.e. the front edge as seen in the direction of advance) cannot become caught behind anything. This can be avoided by affixing the front edge to the card 3 locally or over its entire width, for example by a small

piece of adhesive tape 25. To allow easy removal of the object 18 from the card 3 in the completed printed product, it is preferable for the object 18 only to be stuck to the card 3 locally, for example at one location 26, rather than over a large area. This represents a significant departure from the film-like membership cards which are already known per se and are stuck over their entire surface, as an easily removable label, to a sheet or card which is to be incorporated in the printed product.

Figs. 4-7 show how the cards, with the objects 18 (not shown) on them, can be held in a storage container in order to be fed to the card-sticking machine 1. As shown in Fig. 4, the web of cards 4 is present in one or more stacks, with the web 4 in a stack being folded in zigzag ("fan folded"), the folded edges being denoted by 37 and 39. These folded edges preferably also form the longitudinal boundaries of a card 3 and also the weakened lines. Each stack is preferably inside a box 61, 63. The web 4 continues uninterrupted into the adjacent stack, with the web 4 preferably extending from the bottom of one stack (in Fig. 4 in box 63) along this stack before passing to the top of the next stack (in Fig. 4 in the box 61), etc. In this way, the web 4 can be successively pulled out of the stacks, starting at the top of the stack in box 63 and from there down to the bottom of this stack before then starting without interruption at the top of box 61, etc. In this way, it is possible for a compact stock of web of cards to be fed at very high speed to the card-sticking machine 1. Figs. 5-7 show how stacks of this type may be arranged next to one another and behind one another, with the web 4 continuing without interruption into all the stacks. As can be seen from the drawing, web 4 runs through the stacks column by column, in the manner illustrated in Fig. 2, and the web 4 follows a loop 72 at the transition from one column to the next. In this way, the web 4 runs from the bottom of the last stack in one row to the top card 3 in the last stack in the next row. Further details are to be found in EP-B1 0 763 491. The reference numerals starting from 30 used in Figs. 4-7 correspond to those used in EP-B1 0 763 491 and denote corresponding elements. The reference numerals below 30 used in EP-B1 0 763

491 are also included in Figs. 4-7, with 100 added to them. For example, the present invention relates to the subject matter of one of claims 1-8 from EP-B1 0 763 491, with the particular feature that these transverse folds are weakened lines along which the material can be separated in the card-sticking machine, while objects are applied to the material, so that they can be secured in the printed product by the card-sticking machine. This allows more than 100,000 cards to be supplied as a single package.

Other ways of combining the web of cards to form a compact stock also form part of the invention. For example, in a variant on that shown in Figs. 5-7, the web of cards 4 runs from the bottom of the last stack in one row to the top card 3 in the first stack of the next row, so that the loop 72 extends from one side to the opposite side of the container 110. A similar example is discussed in column 6, lines 34-51 of EP-B1 0 763 491.

The loop 72 may optionally include a turn.

It should also be noted that use of the invention may require particular attention for what are known as sandwich rolls in the printing press, on account of the possibly locally thicker nature of the object which is passing through sandwich rolls of this type (which hold the strip of paper under tension). It will therefore be easiest for the invention to be used in a newspaper press rather than an intaglio printing press.

It should be clear that starting on the basis of what has been disclosed in the present document or in response to this disclosure, it will be obvious to the average person skilled in the art that further variants which are based on this knowledge are also encompassed by the invention, for example originating from the omission and/or replacement with an equivalent aspect of one or more aspects from an embodiment which has been described above or derived therefrom, and/or a combination of one or more aspects of an embodiment of this type with one or more aspects of one or more other embodiments of this type.

## CLAIMS

1. Method for applying objects to pages of printed matter, comprising:  
advancing a strip of material which comprises a number of repeating strip lengths, each strip length defining at least one page of the printed matter; and  
joining an object to each repeating strip length of the strip of material.
2. Method according to claim 1, in which joining the object to each repeating strip length of the strip of material comprises:  
providing a web of cards, with an object secured to each card of the web of cards;  
separating each card from the web of cards;  
joining each card to a repeating strip length of the strip of material.
3. Method according to claim 2, in which each card is provided with glue on one side before the card is joined to a repeating strip length of the strip of material.
4. Method according to claim 3, in which each card is provided with glue on that side of the card which faces away from the object.
5. Method according to claim 2, 3 or 4, in which the leading edge of the object is secured to the associated card by means of an adhesive strip.
6. Method according to claim 5, in which the adhesive strip extends partially on that side of the object which faces away from the card.
7. Method according to any of claims 3-6, in which the object is secured to the associated card by an adhesive bond substantially in spot form.

8. Method according to any of claims 2-7, in which the card is joined to a repeating strip length of the strip of material by means of a line of adhesive in the vicinity of an edge of the card.

9. Method according to any of claims 2-8, in which the card is joined to a repeating strip length of the strip of material by means of an adhesive bond substantially in spot form in the vicinity of an edge of the card.

10. Method according to claim 9, in which the adhesive bond which is substantially in spot form is located in the vicinity of a leading edge of the card.

11. Device for carrying out the method according to any of the preceding claims.

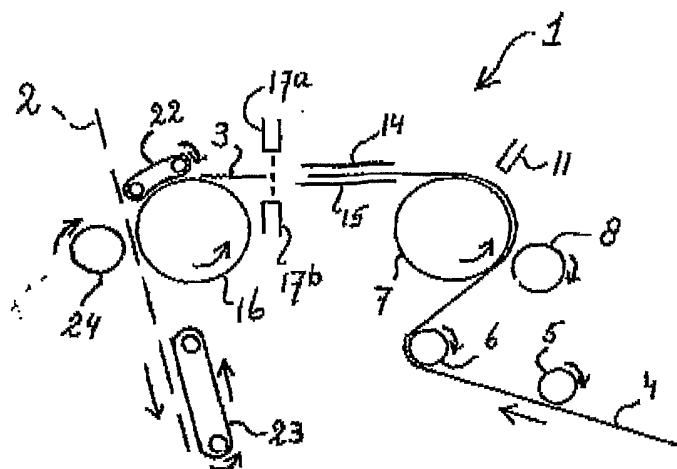


Fig. 1

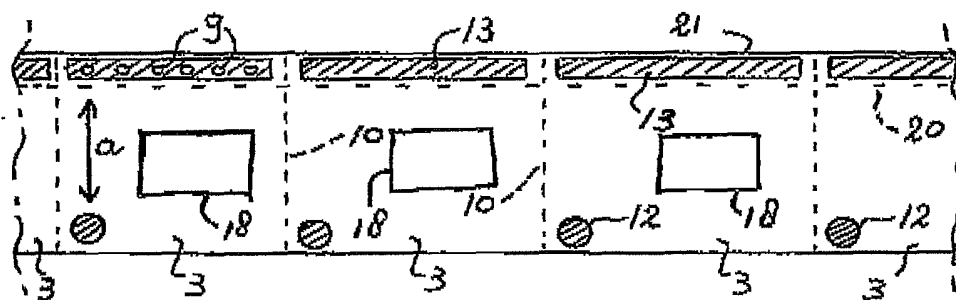


Fig. 2

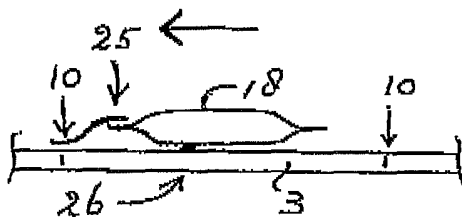


Fig. 3

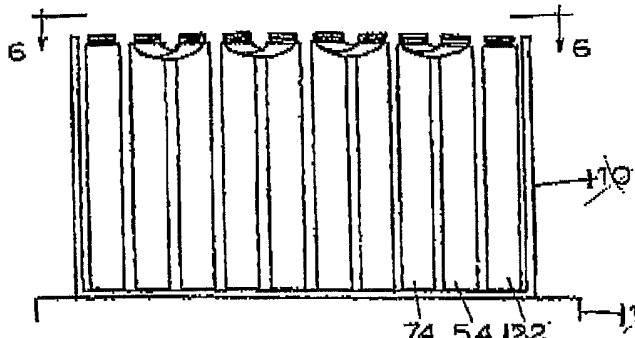


FIG. 5

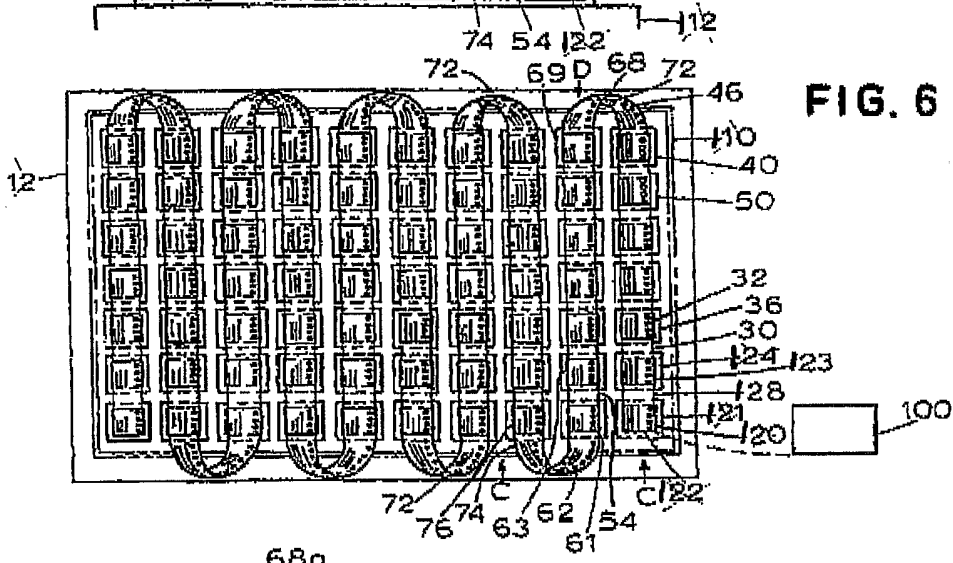


FIG. 6

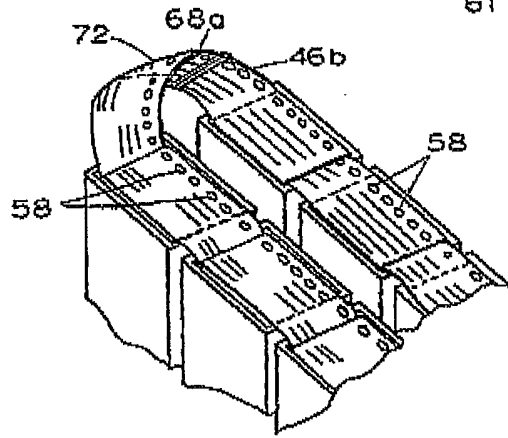


FIG. 7

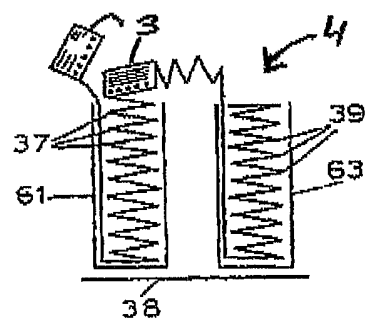


Fig. 4



# INTERNATIONAL SEARCH REPORT

International Application No

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**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 B65H39/14

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65H B65D A45D B42D G09F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	EP 1 312 570 A (COMMCARD BV) 21 May 2003 (2003-05-21) figures 1,2	1, 3, 8-11
X	----- US 4 351 517 A (NEAL BARRY ET AL) 28 September 1982 (1982-09-28) cited in the application column 2, line 35 - column 2, line 68; figure 1	1, 3, 8, 11
X	----- EP 0 949 178 A (HURLETRON INC) 13 October 1999 (1999-10-13) cited in the application column 3, line 5 - column 3, line 24; figures 1,3	1, 3, 8, 11
	----- -/--	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents:

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Date of the actual completion of the international search

29 June 2004

Date of mailing of the international search report

20/07/2004

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## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/NL2004/000123

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 763 491 A (INTOUCH MARKETING SERVICES INC) 19 March 1997 (1997-03-19) cited in the application figure 6 -----	2
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