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(54) PAD, TAPE AND FORMING METHODS

PAPIERBLOCK, STREIFEN UND VERFAHREN ZU DEREN HERSTELLUNG

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WO-A-91/08909	FR-A- 2 320 190
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Description

The present invention relates to methods for forming sheets or strips having coatings of repositionable pressure sensitive adhesive that releasably adhere the sheets together in the pad or the strips in a roll, which sheets or strips have indicia on one major surface; to master stacks from which pads are cut; and to methods for forming such master stacks, pads or rolls.

Background Art

Pads of sheets are known in (e.g. EP-A-0 261 817) which the sheets have coatings of repositionable pressure sensitive adhesive on one major surface that releasably adhere the sheets together in the pad, and the sheets have indicia on their major surfaces opposite the coatings of adhesive that may include, for example, graphics, pictures, designs, or alpha numeric information including printed words or numbers. One conventional method that has been used for making such pads includes the steps of (1) providing a printing press capable of printing indicia along a web or length of sheet material passed through the press utilizing printing plates mounted on the press; (2) passing a web or length of sheet material having a coating of repositionable pressure sensitive adhesive along a first side surface through the printing press to print the side surface of the length of sheet material opposite the coating of repositionable pressure sensitive adhesive with the indicia; and (3) converting the printed web or length of sheet material into a plurality of pads with portions of the coating of repositionable pressure sensitive adhesive on the sheets releasably adhering the sheets together in the pads and with the sheets in the pad having indicia on the various sheets in the pad. The converting step in this method is typically performed by (1) cutting the printed length of sheet material into parts of a predetermined size; (2) stacking the parts together to form a master stack; and (3) cutting the master stack into portions to form the plurality of pads.

Pads have been made using the method described above in which the coating of repositionable pressure sensitive adhesive on each of the sheets is in a band on one of its major surfaces adjacent one of its edges with the sheet being free of adhesive on that major surface adjacent its opposite edge, and the sheets are stacked either (1) with the adhesive coating on each successive sheet in the pad being disposed along alternate opposite sides of the pad, or (2) with the bands of adhesive coating on the sheets in the stack disposed along the same side of the pad.

Moreover, from FR-A-2 320 190 it is known to coat tape with an adhesive and to helically wind rolls of tape so as to cut the tape in order to establish pads of sheets adhered to each other.

US-A-3 902 655 describes a method for the manufacture of a series of side-by-side interconnected, sin-

gle-ply, multi-panel envelope forms from a continuously advancing web of sheet material. The forms are adapted to be continuously fan-folded into sealed, envelope-defining relationship, and to be thereafter severed from the series as individual items for distribution. The forms are provided with variable indicia applied to the continuously advancing web by means of a jet controlled printer.

It is the object of the present invention to provide a method for forming printed pads, master stacks or rolls in which at least parts of the indicia can be easily varied and accordingly are different from the indicia on another part of a pad, master stack or roll.

This object is solved according to the invention by means of a method of claims 1, 7 and 12, respectively.

The method of the present invention for forming pads, master stacks or rolls according to the present invention includes the steps of (1) providing a digital electronic printing mechanism capable of printing infinitely variable indicia along a web or length of sheet material passed through the printing mechanism in response to a series of digital electronic signals to the printing mechanism; (2) coating a first side surface of a web or length of sheet material with pressure sensitive adhesive; (3) passing the length of sheet material through the printing mechanism while sending a series of digital electronic signals to the printing mechanism so that the printing mechanism will print various indicia on either or both of the side surfaces of the length of sheet material, with at least portions of the indicia being varied in a non repetitive pattern along the length of sheet material; and (4) converting the coated and printed length of sheet material either (a) into a plurality of the pads with portions of the coating of repositionable pressure sensitive adhesive on the sheets releasably adhering the sheets together in the pads, or (b) into a plurality of rolls of tape each comprising an elongate strip cut from the length of sheet material having a coating of pressure sensitive adhesive by which the wraps of the printed elongate strip in the roll of tape are releasably adhered together. That converting step to make the pads can be done by cutting the printed length of sheet material into parts of a predetermined size; stacking the parts together to form a master stack; and cutting the master stack into portions to form the plurality of pads.

Such a method provides several significant advantages over prior art methods. It allows the easy manufacture of pads in which at least a portion of the indicia on some sheets in the pad is different from the indicia on other sheets in the pad which, for example, would allow certain sheets in the pads to be calendars for different months or weeks or days, and could provide different messages or blank sheets between such calendar sheets, or would allow different sheets to bear a different pictures (e.g., sequential cartoons or sequential pictures or other images that are sufficiently different to provide the illusion of motion by sequentially bending back and releasing portions of the sheets on which the

pictures are printed, which cartoons, pictures or images could be all at one location or change locations on the sheet to provide, for example, the illusion of a person walking across the sheet) or different messages which may be in an infinite variety of different type sizes, styles, weights or widths, such as different sayings or religious messages (i.e., different Bible quotations or prayers), or different advertisements for different ones of a manufacturers products which may include different logos or other corporate or commercial marks such as brand names or trademarks. Also, it allows the relatively inexpensive manufacture of pads with customized indicia in limited quantities, which limited quantities, if printed on a conventional printing press requiring printing plates, would be significantly more expensive because of the labor and materials (i.e., negatives and plates) need to make the printing plates, and the need for stopping the press to change the plates and thereby the images that will be printed between press runs.

By means of the methods of the present invention, it is possible to provide a pad comprising a plurality of sheets of the types described above which have indicia on their major surfaces, or a master stack from which such pads can be cut, or rolled strips having indicia on their major surfaces, at least portions of which indicia on each master stack, pad or rolled strip varies in a non repetitive pattern on the various sheets in the pad or master stack or along the strips.

The present invention will be further described with reference to the accompanying drawing wherein like reference numerals refer to like parts in the several views, and wherein:

Figure 1 and 2 are schematic views illustrating a first embodiment of a method according to the present invention for forming a pad;

Figure 3 is a perspective view illustrating a first embodiment of a pad according to the present invention made by the method of Figure 1 and 2;

Figure 4 is a perspective view illustrating a second embodiment of a pad according to the present invention;

Figure 5 is a schematic view illustrating a second embodiment of a method according to the present invention that can be used for forming the pad illustrated in Figure 4;

Figure 6 is an enlarged fragmentary sectional view taken approximately along line 6-6 of Figure 5;

Figures 7 and 8 are schematic views illustrating a third embodiment of a method according to the present invention for forming a roll of material; and Figure 9 is a schematic view illustrating a fourth embodiment of a method according to the present invention for forming both a pad and a roll of material according to the present invention.

Referring now to Figures 1 and 2 of the drawing, there is schematically illustrated a method according to

the present invention for forming pads 10 of sheets of the type illustrated in Figure 3. Generally that method comprises the steps of (1) providing a digital electronic printing press or mechanism 11 capable of printing infinitely variable indicia on one or both sides along a length of sheet material passed through the printing mechanism 11 in response to a series of digital electronic signals sent to the printing mechanism 11; (2) coating a first side surface of a web or length 12 of sheet material (e.g., paper or polymeric film) with a coating 14 of pressure sensitive adhesive; (3) passing the length 12 of sheet material through the printing mechanism 11 while sending a series of digital electronic signals to the printing mechanism 11 so that the printing mechanism 11 will print various indicia 16 on one or both side surfaces of the length 12 of sheet material, with at least portions of the indicia 16 being varied in a non repetitive pattern along the length 12 of the sheet material; and (3) converting the coated and printed length 12 of sheet material into a plurality of the pads 10 each comprising a plurality of sheets with portions 26 of the coating 14 of pressure sensitive adhesive on the sheets releasably adhering the sheets together in the pads 10.

The first side surface of the web or length 12 of sheet material could be coated with the coating 14 of repositionable pressure sensitive adhesive either totally or in a predetermined pattern (e.g., in strips as illustrated) before it is printed using an adhesive coating mechanism (not shown) such as a hot melt coater for pressure sensitive adhesive of the type sold by Mercer Corporation, Hendersonville, TN; a slot coater for U.V. curable pressure sensitive adhesives, or a rotogravure printing system for applying pressure sensitive adhesives. Alternatively, the first side surface of the web or length 12 of sheet material could be coated either totally or in a predetermined pattern with either repositionable or permanent pressure sensitive adhesive after it is printed by the printing mechanism and before it is converted using one of the afore mentioned types of adhesive coating mechanisms positioned as indicated by the dotted outline 18.

As illustrated in Figures 1 and 2, the converting step comprises the steps of (a) sequentially cutting the coated and printed length 12 of sheet material into parts 22 of the same predetermined size; (b) stacking the parts 22 together to form a master stack 24, which cutting and stacking steps are done using a cutting and stacking mechanism 20 of the type described in U.S.-A-4,102,253 that is schematically illustrated in Figure 1); and (c) cutting the master stack 24 into portions with a conventional guillotine cutter 23 (Figure 2) to form the plurality of pads 10.

The digital electronic printing press or mechanism 11 used in the method illustrated in Figures 1 and 2 could be any one of a number of commercially available printing mechanisms including the electrographic "ElectroPress" digital electronic printing press, sold by Advanced Imaging Products, a business unit of AM

Graphics, AM International, Inc., Dayton, Ohio; the 3500 "Ink-jet High Speed Printing System" sold by Eastman Kodak, Dayton, Ohio; the "Presidax Ion-deposition" printing mechanism sold by Delphax Systems, Inc., Canton, Massachusetts; or the "Magnetographic Varypress" printing mechanism sold by Bull Printing Systems, Inc., Billerica, Massachusetts. Typically, such printing mechanisms 11 sequentially form the indicia along the surface of the length 12 of sheet material either directly (e.g., as through the use of ink jet printing) or by initially forming indicia on the surface of a drum within the printing mechanism and then transferring and fixing the indicia along the surface of the length 12 of sheet material. Such printing mechanisms 11 can be operated at normal printing press operating speeds and with significant speed variations to print various indicia 16 on the surface of the length 12 of sheet material corresponding to a series of digital electronic signals generated by a computer 17. The computer 17 can generate the series of digital electronic signals from direct operator input through custom software or any of many commercially available software programs such as "Microsoft Word", "Aldus' PageMaker", or Xerox's Ventura Publisher", or from electronically scanned material, or from stored memory, or a combination of these or similar sources using a EPS or electronic pre-press system by which digital electronic signals from different sources (e.g., signals which form a repetitively used portion of the indicia and signals that form a changing portion of the indicia) are combined electronically to provide the digital electronic signals from which the indicia 16 are sequentially printed along the length 12 of sheet material. The use of such digital electronic signals to control such a printing mechanism 11 allows the operator of the system to easily prepare and/or change the content or arrangement or positioning of the indicia to be printed on the length 12 of sheet material moving through the printing mechanism 11, even without stopping the printing mechanism 11.

If the printing mechanism 11 used is capable of printing only on the side of the web or length 12 of sheet material opposite the coating 14 of pressure sensitive adhesive, the length 12 of sheet material can, if desired, be printed with indicia on its adhesive coated side by providing a second printing mechanism (not shown) along the side of the path for the length 12 of sheet material opposite the printing mechanism 11, which second printing mechanism might or might not be a digital electronic printing mechanism and could apply printing on the side of the length 12 of sheet material on which the adhesive is coated either over the adhesive coating 14, or, if the coating of adhesive is applied from the location 18, before the adhesive coating is applied so that at least portions of the printing may be seen through the adhesive coating.

As an example, the method illustrated in Figures 1 and 2 can be used to make the pad 10 illustrated in Figure 3 which comprises a plurality of sheets 25 that are

parts of the length 12 of sheet material and each have a coating 26 of pressure sensitive adhesive (e.g., either repositionable or permanent Pressure sensitive adhesive, which coating 26 is a part of one of the strips in the coating of pressure sensitive adhesive 14 illustrated in Figure 1) on one of its major surfaces with the coatings 26 of repositionable pressure sensitive adhesive on the sheets 25 releasably adhering together the sheets 25 in the pad 10 and the sheets 25 in the pad 10 having the indicia 16 on their major surfaces opposite the coatings 26 of repositionable pressure sensitive adhesive with at least portions of the indicia 16 varying in a non repetitive pattern on the various sheets 25 in the pad 10.

As illustrated in Figure 3, the indicia 16 on the sheets 25 include (1) repetitive portions in the form of a company name or logo 27 that is printed the same and in the same location centered along the top portion of each sheet 26, (2) a first variable portion providing a calendar 28 in which the days of each successive month and the name of each successive month is printed in sequence on the successive sheets 26 in the pad 10, and (3) a second variable portion centered along the bottom portion of each sheet which on each sheet is a printed name and picture or illustration 29 of a different product sold by the company named by the company name 27 at the top center of the sheet 26. To form a pad 10 in the form of such a customized calendar for a customer, an operator of the computer 17 that generates the series of digital electronic signals for the printing mechanism 11 can, for example, supply the company name 27 using a data entry program, or a word processing program or from a data base file; provide the sequential calendars 28 from pre-prepared stored memory in the computer 17 or in a compatible magnetic or optical storage media; supply the names 29 of the products from data and/or text files generated by data bases and/or word processing programs; and supply the pictures 29 of the products to the system from image files created by image generating software, scanning of photographic images, illustration/drawing programs, files of digitized images, or from a computer aided design system (e.g., "CAD/CAM").

In the pad 10 illustrated in Figure 3, the coating 26 of pressure sensitive adhesive on each of the sheets 26 is in a band on one major surface adjacent one edge of the sheet 26 with the sheet 26 being free of adhesive on a major portion of that major surface adjacent its opposite edge, and the sheets 26 are stacked with the bands of pressure sensitive adhesive coating on the sheets 26 in the stack 24 disposed along the same side of the pad 10. Pads 10 of this type can be made by the method illustrated in Figures 1 and 2 by providing the coating 14 of pressure sensitive adhesive on the length 12 of sheet material as illustrated in transversely spaced longitudinally extending strips, parts of which strips are registered to provide the adhesive pattern described for the sheets 25 when the pads 10 are formed. If the adhesive

used is permanent pressure sensitive adhesive, it may also be necessary to print coatings of a suitable release material on at least the portions of the sheets 26 contacted by the coatings 14 of pressure sensitive adhesive in the pad 10.

An alternative form of a pad 30 of sheets 32 that can be made by the method according to the present invention is illustrated in Figure 4, which pad bears the types of indicia 27, 28 and 29 described above. In the pad 30, a coating 31 of pressure sensitive adhesive (which could be repositionable or permanent) on each of the sheets 32 is in a band on one major surface adjacent one edge of the sheet 32 with the sheet 32 being free of adhesive on that major surface adjacent its opposite edge, and the sheets 32 are stacked with the adhesive coating on each successive sheet 32 in the pad 30 being disposed along alternate opposite sides of the pad 30 and releasably adhering the major surfaces of the adjacent sheets 32 in the pad 30 together to maintain the sheets 32 in the pad 30. If the adhesive used is permanent pressure sensitive adhesive, it may also be necessary to print coatings of suitable release material on the portions of the sheets 32 contacted by the coatings 31 of pressure sensitive adhesive. The pad 30 provides the advantage that the sheets 32 from the pad 30 are easily dispensable from dispensers of the type illustrated in U.S.-A-4,921,127.

The method for making the pad 30, which is similar to the method illustrated in Figures 1 and 2, is illustrated in Figure 5. That method comprises the steps of (1) providing two electronically operated printing mechanisms or printing presses 40 and 41 each of which could be of the type described above with reference to the printing mechanism 11 and is capable of printing infinitely variable indicia on one or both major surfaces along a length of sheet material passed through the printing mechanism 40 or 41 in response to a series of digital electronic signals sent to the printing mechanism 40 or 41; (2) passing two lengths 42 and 43 of sheet material (e.g., paper or polymeric material) having coatings 44 and 45 of pressure sensitive adhesive along a first side surface through the printing mechanisms 40 or 41 while sending a series of electronic signals from a computer 48 to each of the printing mechanisms 40 and 41 so that each printing mechanism 40 and 41 will print various indicia 46 on the side surface of the length 42 or 43 of the sheet material passing through it, with at least portions of the indicia 46 being varied in a non repetitive pattern along the lengths 42 and 43 of sheet material; and (3) converting the printed lengths 42 and 43 of sheet material into a plurality of the pads 30 each comprising a plurality of the sheets 32 with portions 31 of the coating 14 of repositionable pressure sensitive adhesive on the lengths 42 and 43 of sheet material adhering the sheets 32 together in the pads 30.

The converting step comprises the steps of (1) sequentially cutting parts 52 and 54 from the ends of the printed lengths 42 and 43 of sheet material that are of

the same predetermined size; (2) stacking the parts 52 and 54 together with each of the parts 52 between two of the parts 54 and each of the parts 54 between two of the parts 52 to form a master stack 55, which cutting and stacking steps are done using a cutting and stacking mechanism 56 of the type described in U.S.-A-4,102,253 that is schematically illustrated in Figure 5; and (3) cutting the master stack 44 into portions using a conventional guillotine cutter (not shown, but essentially the same as the cutter illustrated in Figure 2) to form the plurality of pads 30. In the method illustrated in Figure 5, the coatings 44 and 45 of pressure sensitive adhesive on both of the lengths 42 and 43 of sheet material are in longitudinally extending spaced strips of the pressure sensitive adhesive. Those spaced strips are registered or positioned with respect to each other as is illustrated in Figure 6 which shows two of the parts 42 and two of the parts 43 in the stack 55 to provide the adhesive pattern described above for the sheets in the pads 30 when the pads 30 are formed by cutting the stack 55 generally along the dotted lines 58 illustrated in Figure 6.

In the method as illustrated in Figure 5 the coatings 44 and 45 are of repositionable pressure sensitive adhesive and are applied to the lengths 42 and 43 of sheet material before they are printed by the printers 40 and 41. Alternatively, the coatings 44 and 45 of pressure sensitive adhesive could be repositionable or permanent and could be applied to the lengths 42 and 43 of sheet material after they are printed by the printers 40 and 41 and before they are converted by placing adhesive coating devices along the paths for the lengths 42 and 43 of sheet material after the printers 40 and 41. Also, if the printing mechanisms 40 and 41 used are capable of printing only on the sides of the webs or lengths 42 and 43 of sheet material opposite the coatings 44 and 45 of pressure sensitive adhesive, the lengths 42 and 43 of sheet material could, if desired, be printed with indicia on their adhesive coated sides by providing third and fourth printing mechanisms (not shown) along the sides of the paths for the lengths 42 and 43 of sheet material opposite the printing mechanisms 40 and 41 respectively, which printing mechanisms might or might not be digital electronic printing mechanisms and could apply printing on the sides of the lengths 42 and 43 of sheet material on which the adhesive is coated either over the coatings 44 and 45 of adhesive, or, if the coatings of adhesive are applied after the printing mechanisms 40 and 41, before the adhesive coatings are applied so that at least portions of the printing may be seen through the coatings of adhesive.

As is illustrated in Figures 7 and 8, the method according to the present invention can also be adapted for forming helically wound rolls 60 of tape. In that adaptation, the method includes the steps of (1) providing a digital electronic printing mechanism 61 capable of printing infinitely variable indicia along a web or length of sheet material passed through the printing mecha-

nism 61 in response to a series of digital electronic signals sent to the printing mechanism 61; (2) coating a first side surface of a web or length 62 of sheet material with a coating 63 of pressure sensitive adhesive; (3) passing the length 62 of sheet material through the printing mechanism 61 while using a computer 65 to send a series of digital electronic signals to the printing mechanism 61 so that the printing mechanism 61 will print various indicia 64 on one or both side surfaces of the length 62 of sheet material, with at least portions of the indicia 64 being varied in a non repetitive pattern along the length 62 of sheet material; and (4) converting the coated and printed length 62 of sheet material into a plurality of rolls of tape 60 of the type illustrated in Figure 8, each of which rolls of tape 60 comprises an elongate strip 68 cut from the length 62 of sheet material and has a coating 66 of pressure sensitive adhesive on a first surface by which the wraps of the printed elongate strip 68 in the rolls 60 of tape are releasably adhered together and with the printed elongate strip 68 in the roll 60 having indicia with at least portions of the indicia varying in a non repetitive pattern along its length. That conversion step, as is illustrated in Figures 7 and 8 comprises the steps of (1) rolling the printed length 62 of sheet material into a jumbo roll 63 as is illustrated in Figure 7; (2) unrolling the printed length 62 of sheet material from the jumbo roll 63 as is illustrated in Figure 8, which typically is done at a separate location; (3) slitting the unrolled printed length 62 of sheet material into the elongate strips 68; and (4) rolling the elongate strips 68 into the rolls 60. Alternatively, the step of rolling the printed length 62 of sheet material into a jumbo roll 63 as is illustrated in Figure 7 and unrolling the printed length 62 of sheet material from the jumbo roll 63 as is illustrated in Figure 8 could be eliminated, and the slitting and rolling steps could be done on the same production line that includes the printing mechanism 61.

As illustrated, one major surface of the length 12 of sheet material is totally coated with a coating of repositionable pressure sensitive adhesive before it is printed, however, alternatively the length 12 of sheet material could be coated with pressure sensitive adhesive (which could be repositionable or permanent) after it is printed and before it is converted by placing an adhesive coating device along the path for the length 12 of sheet material after the printing mechanism 61, or by adhesive coating the printed length 12 of sheet material at a separate location. Also, the length of sheet material could be printed with indicia on both sides by providing a second printing mechanism 70 (shown in dotted outline) along the side of the path for the length 12 of sheet material opposite the printing mechanism 61 which might or might not be a digital electronic printing mechanism, which printing on the side on which the adhesive is coated could be done over the adhesive coating, or could be done before the adhesive coating is applied so that at least a portion of the printing may be seen

through the coating of adhesive.

Referring now to Figure 9 there is illustrated a fourth embodiment of a method according to the present invention that can be used to form both pads similar to the pads 10 described above and rolls of material similar to the rolls of material 60 described above, which method is essentially a combination of the methods described above with reference to Figures 1, 2, 7 and 8. Generally, the method illustrated in Figure 9 includes the steps of (1) providing a digital electronic printing mechanism 81 capable of printing infinitely variable indicia along a web or length of sheet material passed through the printing mechanism 81 in response to a series of digital electronic signals sent to the printing mechanism 81; (2) coating a first side surface of a web or length 82 of sheet material with a coating 83 of pressure sensitive adhesive; (3) passing the length 82 of sheet material through the printing mechanism 81 while using a computer 85 to send a series of digital electronic signals to the printing mechanism 81 so that the printing mechanism 81 will print various indicia 84 on one or both side surfaces of the length 82 of sheet material, with at least portions of the indicia 84 being varied in a non repetitive pattern along the length 82 of sheet material; converting a first longitudinally extending side portion 87 of the coated and printed length 82 of sheet material into a plurality of pads with portions of the coating 83 of repositionable pressure sensitive adhesive on the sheets releasably adhering the sheets together in the pads; and converting a second or the other elongate side portion 88 of the coated and printed length 82 of sheet material into a plurality of rolls of tape similar to the rolls 70 each comprising an elongate strip cut from the length 82 of sheet material and having a coating of pressure sensitive adhesive on a first surface by which the wraps of the printed elongate strips in the rolls of tape are releasably adhered together and with the elongate strips in the rolls having indicia with at least portions of the indicia varying in a non repetitive pattern along their length.

The converting step for converting the coated and printed first side portion 87 of the length 82 of sheet material into pads comprises the steps of (a) sequentially cutting the first side portion 87 into parts 92 of the same predetermined size; (b) stacking the parts 92 together to form a master stack 94 (which cutting and stacking steps are done using a cutting and stacking mechanism 90 of the type described in U.S.-A-4,102,253 that is schematically illustrated in Figure 9); and (c) cutting the master stack 94 into portions with a conventional guillotine cutter to form the plurality of pads in the manner the master stack described above was cut using the cutter 23 illustrated in Figure 2.

The converting step for converting the coated and printed second side portion 88 of the length 82 of sheet material into rolls comprises the steps of (1) rolling the printed second side portion 88 into a jumbo roll 93; (2) unrolling the printed second side portion 88 of sheet

material from the jumbo roll 93; (3) slitting the unrolled printed second side portion 88 into the elongate strips; and (4) rolling the elongate strips into the rolls in the same manner the jumbo roll 63 is unrolled, slit and the resulting strips rolled as was described above with reference to Figure 8. Alternatively, the steps of rolling and unrolling the printed side portion could be eliminated, and the slitting step and the step of rolling the strips could be done on the same production line that includes the printing mechanism 81.

As illustrated, one major surface of the length 82 of sheet material is coated in strips along the side portion and is totally coated along the side portion with repositionable pressure sensitive adhesive before it is printed, however, alternatively the length 82 of sheet material could be coated with pressure sensitive adhesive (which could be repositionable or permanent) after it is printed and before it is converted by placing an adhesive coating device 98 (indicated by a dotted outline) along the path for the length 82 of sheet material after the printing mechanism 81, or by adhesive coating the printed length 82 of sheet material at a separate location. Also, the length of sheet material could be printed with indicia on both sides by providing a second printing mechanism (not shown) along the side of the path for the length 82 of sheet material opposite the printing mechanism 81 which might or might not be a digital electronic printing mechanism, which printing on the on which the adhesive is coated could be done over the adhesive coating, or could be done before the adhesive coating is applied so that at least a portion of the printing may be seen through the coating of adhesive.

Claims

1. A method for forming pads (10) of sheets, said method including the steps of:

providing a printing mechanism (11) capable of printing indicia (16) along a length (12) of sheet material passed through the printing mechanism (11),

coating a side surface of a length (12) of sheet material with pressure sensitive adhesive (14); passing the length (12) of sheet material through the printing mechanism (11) while the printing mechanism (11) prints indicia (16) along the length of the length (12) of sheet material, and

converting the coated and printed length (12) of sheet material into a plurality of pads (10) with portions (26) of the coating of pressure sensitive adhesive (14) on the sheets adhering the sheets together in the pads;

said method being characterized in that said printing mechanism (11) provided in said providing step is a digital electronic printing mechanism (11) capable of printing infinitely

variable indicia (16) along a length (12) of sheet material passed through the printing mechanism (11) in response to a series of digital electronic signals to the printing mechanism (11), and during said passing step a series of digital electronic signals are sent to the printing mechanism (11) so that the printing mechanism (11) will print various indicia (16) along the length of the length (12) of sheet material, with at least portions of the indicia (16) being varied in a non repetitive pattern along the length (12) of sheet material.

2. A method for forming pads (10) of sheets according to claim 1 wherein said converting step comprises the steps of

cutting the printed length (12) of sheet material into parts (22) of a predetermined size;

stacking the parts (22) together to form a master stack (24); and

cutting the master stack (24) into portions to form the plurality of pads (10).

3. A method for forming pads (10) of sheets according to claim 1 wherein said coating step coats the side surface of the length (12) of sheet material with repositionable pressure sensitive adhesive (14).

4. A method for forming pads (10) of sheets according to claim 3 wherein said coating step is done prior to said passing step.

5. A method for forming pads (10) of sheets according to claim 1 wherein said coating step coats the side surface of the length (12) of sheet material with permanent pressure sensitive adhesive (14) and said coating step is done after said passing step.

6. A method for forming pads (10) of sheets according to claim 1 wherein in said passing step the printing mechanism (11) prints various indicia (16) along both sides of the length (12) of sheet material.

7. A method for forming a master stack (24) from which pads (10) of sheets may be cut, said method including the steps of:

providing a printing mechanism (11) capable of printing indicia (16) along a length (12) of sheet material passed through the printing mechanism (11);

coating a side surface of a length (12) of sheet material with pressure sensitive adhesive (14); passing the length (12) of sheet material through the printing mechanism (11) while the printing mechanism (11) prints indicia (16) along the length of the length (12) of sheet

material; and

cutting the printed length (12) of sheet material into parts of a predetermined size; and
stacking the parts together to form a master stack (24) which may be cut into portions to form a plurality of pads;

said method being characterized in that said printing mechanism (11) provided in said providing step is a digital electronic printing mechanism (11) capable of printing infinitely variable indicia (16) along a length (12) of sheet material passed through the printing mechanism (11) in response to a series of digital electronic signals to the printing mechanism (11), and during said passing step a series of digital electronic signals are sent to the printing mechanism (11) so that the printing mechanism (11) will print various indicia (16) along the length of the length (12) of sheet material, with at least portions of the indicia (16) being varied in a non repetitive pattern along the length (12) of sheet material.

8. A method for forming a master stack (24) according to claim 7 wherein said coating step coats the side surface of the length (12) of sheet material with repositionable pressure sensitive adhesive (14).

9. A method for forming a master stack (24) according to claim 8 wherein said coating step is done prior to said passing step.

10. A method for forming a master stack (24) according to claim 7 wherein said coating step coats the side surface of the length (12) of sheet material with permanent pressure sensitive adhesive (14) and said coating step is done after said passing step.

11. A method for forming a master stack (24) according to claim 7 wherein in said passing step the printing mechanism (11) prints various indicia (16) along both sides of the length (12) of sheet material.

12. A method for forming helically wound rolls (60) of tape including the steps of

providing a printing mechanism (61) capable of printing indicia along a length of sheet material passed through the printing mechanism (61),
coating a side surface of a length (62) of sheet material with pressure sensitive adhesive (63);
passing the length (62) of sheet material through the printing mechanism (61) while the printing mechanism (61) prints indicia along the length of the length (62) of sheet material, and
convening the coated and printed length (62) of sheet material into a plurality of rolls (60) of

tape each comprising an elongate strip cut from the length (62) of sheet material and having a coating of pressure sensitive adhesive (63) on a first surface by which the wraps of the printed elongate strip in the roll of tape (60) are releasably adhered together

said method being characterized in that said printing mechanism (61) provided in said providing step is a digital electronic printing mechanism (61) capable of printing infinitely variable indicia along a length (62) of sheet material passed through the printing mechanism (61) in response to a series of digital electronic signals to the printing mechanism (61); and during said passing step a series of digital electronic signals are sent to the printing mechanism (61) so that the printing mechanism (61) will print various indicia along the length of the length (62) of sheet material, with at least portions of the indicia being varied in a non repetitive pattern along the length (62) of sheet material so that the elongate strip in the roll has indicia with at least portions of the indicia varying in a non repetitive pattern along its length.

13. A method for forming helically wound rolls according to claim 12 wherein said converting step comprises the steps of

rolling the coated and printed length (62) of sheet material into a jumbo roll;
unrolling the coated and printed length (62) of sheet material from the jumbo roll;
slitting the unrolled coated and printed length (62) of sheet material into a plurality of elongate strips; and
rolling each of the elongate strips into one of the rolls (60) of tape.

14. A method for forming helically wound rolls according to claim 13 wherein said converting step comprises the steps of:

slitting the coated and printed length (62) of sheet material into a plurality of elongate strips; and
rolling each of the elongate strips into one of the rolls (60) of tape.

15. A method for forming helically wound rolls according to claim 12 wherein said coating step coats the side surface of the length (62) of sheet material with repositionable pressure sensitive adhesive.

16. A method for forming helically wound rolls according to claim 12 wherein said coating step is done prior to said passing step.

17. A method for forming helically wound rolls according to claim 12 wherein said coating step coats the side surface of the length (62) of sheet material with permanent pressure sensitive adhesive and said coating step is done after said passing step.

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18. A method for forming helically wound rolls according to claim 12 wherein in said passing step the printing mechanism (61) prints various indicia along both sides of the length (61) of sheet material.

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Patentansprüche

1. Verfahren zum Bilden von Blöcken (10) von Blättern, mit den folgenden Schritten:

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Bereitstellen eines Druckmechanismus (11), der in der Lage ist, Zeichen (16) entlang einer Länge (12) von Blatt-Material aufzudrucken, welches durch den Druckmechanismus (11) hindurchgeführt wird;

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Beschichten einer Seitenfläche einer Länge (12) von Blatt-Material mit druckempfindlichem Kleber (14);

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Hindurchführen der Länge (12) von Blatt-Material durch den Druckmechanismus (11), während der Druckmechanismus (11) Zeichen (16) entlang der Längsrichtung der Länge (12) des Blatt-Materials aufdruckt; und

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Verarbeiten der beschichteten und bedruckten Länge (12) von Blatt-Material zu mehreren Blöcken (10) von Blättern, wobei Bereiche (26) der auf den Blättern angeordneten Beschichtung aus druckempfindlichem Kleber (14) die Blätter in den Blöcken aneinanderhaften lassen;

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wobei das Verfahren dadurch gekennzeichnet ist, daß der in dem Bereitstellungsschritt bereitgestellte Druckmechanismus (11) ein digitaler elektronischer Druckmechanismus (11) ist, der in der Lage ist, auf eine Reihe an den Druckmechanismus (11) ausgegebener digitaler elektronischer Signale hin unbegrenzt variable Zeichen (16) entlang einer durch den Druckmechanismus (11) hindurchgeführten Länge (12) von Blatt-Material aufzudrucken, und daß während des Hindurchführungsschrittes eine Reihe digitaler elektronischer Signale an den Druckmechanismus (11) ausgegeben wird, derart, daß der Druckmechanismus (11) verschiedene Zeichen (16) entlang der Längsrichtung der Länge (12) von Blatt-Material aufdruckt, wobei mindestens Teile der Zeichen (16) in einem nichtrepetierenden Muster entlang der Länge (12) von Blatt-Mate-

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rial variiert werden.

2. Verfahren zum Ausbilden von Blöcken (10) von Blättern nach Anspruch 1, bei dem der Verarbeitungsschritt die folgenden Schritte aufweist:

Schneiden der bedruckten Länge (12) von Blatt-Material in Teile (22) einer vorbestimmten Größe;

Zusammenstapeln der Teile (22) zur Bildung eines Master-Stapels (24); und

Schneiden des Master-Stapels (24) in Teile zur Bildung der mehreren Blöcke (10).

3. Verfahren zum Ausbilden von Blöcken (10) von Blättern nach Anspruch 1, bei dem in dem Beschichtungsschritt die Seitenfläche der Länge (12) von Blatt-Material mit wiederpositionierbarem druckempfindlichen Kleber (14) beschichtet wird.

4. Verfahren zum Ausbilden von Blöcken (10) von Blättern nach Anspruch 3, bei dem der Beschichtungsschritt vor dem Hindurchführungsschritt durchgeführt wird.

5. Verfahren zum Ausbilden von Blöcken (10) von Blättern nach Anspruch 1, bei dem in dem Beschichtungsschritt die Seitenfläche der Länge (12) von Blatt-Material mit permanentem druckempfindlichen Kleber (14) beschichtet wird und der Beschichtungsschritt nach dem Hindurchführungsschritt durchgeführt wird.

6. Verfahren zum Ausbilden von Blöcken (10) von Blättern nach Anspruch 1, bei dem in dem Hindurchführungsschritt der Druckmechanismus (11) verschiedene Zeichen (16) entlang beider Seiten der Länge (12) von Blatt-Material aufdruckt.

7. Verfahren zum Bilden eines Master-Stapels (24), aus dem Blöcke (10) von Blättern geschnitten werden können, mit den folgenden Schritten:

Bereitstellen eines Druckmechanismus (11), der in der Lage ist, Zeichen (16) entlang einer Länge (12) von Blatt-Material aufzudrucken, welches durch den Druckmechanismus (11) hindurchgeführt wird;

Beschichten einer Seitenfläche einer Länge (12) von Blatt-Material mit druckempfindlichem Kleber (14);

Hindurchführen der Länge (12) von Blatt-Material durch den Druckmechanismus (11), während der Druckmechanismus (11) Zeichen (16)

entlang der Längsrichtung der Länge (12) des Blatt-Materials aufdruckt; und

Schneiden der bedruckten Länge (12) von Blatt-Material in Teile einer vorbestimmten Größe; und

Zusammenstapeln der Teile zur Bildung eines Master-Stapels (24), der zur Bildung mehrerer Blöcke in Teile geschnitten werden kann; wobei das Verfahren dadurch gekennzeichnet ist, daß der in dem Bereitstellungs-Schritt bereitgestellte Druckmechanismus (11) ein digitaler elektronischer Druckmechanismus (11) ist, der in der Lage ist, auf eine Reihe an der Druckmechanismus (11) ausgegebener digitaler elektronischer Signale hin unbegrenzt variable Zeichen (16) entlang einer durch den Druckmechanismus (11) hindurchgeführten Länge (12) von Blatt-Material aufzudrucken, und daß während des Hindurchführungs-Schrittes eine Reihe digitaler elektronischer Signale an den Druckmechanismus (11) ausgegeben wird, derart, daß der Druckmechanismus (11) verschiedene Zeichen (16) entlang einer Länge (12) von Blatt-Material aufdruckt, wobei mindestens Teile der Zeichen (16) in einem nichtrepetierenden Muster entlang der Länge (12) von Blatt-Material variiert werden.

8. Verfahren zum Bilden eines Master-Stapels (24) nach Anspruch 7, bei dem in dem Beschichtungs-Schritt die Seitenfläche der Länge (12) von Blatt-Material mit wiederpositionierbarem druckempfindlichen Kleber (14) beschichtet wird.
9. Verfahren zum Bilden eines Master-Stapels (24) nach Anspruch 8, bei dem der Beschichtungs-Schritt vor dem Hindurchführungs-Schritt durchgeführt wird.
10. Verfahren zum Bilden eines Master-Stapels (24) nach Anspruch 7, bei dem in dem Beschichtungs-Schritt die Seitenfläche der Länge (12) von Blatt-Material mit permanentem druckempfindlichen Kleber (14) beschichtet wird und der Beschichtungs-Schritt nach dem Hindurchführungs-Schritt durchgeführt wird.
11. Verfahren zum Bilden eines Master-Stapels (24) nach Anspruch 7, bei dem in dem Hindurchführungs-Schritt der Druckmechanismus (11) verschiedene Zeichen (16) entlang beider Seiten der Länge (12) von Blatt-Material aufdruckt.
12. Verfahren zum Bilden schraubenförmig aufgewickelter Rollen (60) von Band, mit den folgenden Schritten:

Bereitstellen eines Druckmechanismus (61), der in der Lage ist, Zeichen entlang einer Länge von Bahn-Material aufzudrucken, welches durch den Druckmechanismus (61) hindurchgeführt wird;

Beschichten einer Seitenfläche einer Länge (62) von Bahn-Material mit druckempfindlichem Kleber (63);

Hindurchführen der Länge (62) von Bahn-Material durch den Druckmechanismus (61), während der Druckmechanismus (61) Zeichen entlang der Längsrichtung der Länge (62) des Bahn-Materials aufdruckt; und

Verarbeiten der beschichteten und bedruckten Länge (62) von Bahn-Material zu mehreren Rollen (60) von Band, die jeweils einen länglichen Streifen aufweisen, der aus der Länge (62) von Bahn-Material geschnitten ist und auf einer ersten Fläche eine Beschichtung aus druckempfindlichem Kleber (63) aufweist, mittels dessen die Wicklungen des bedruckten länglichen Streifens in der Rolle von Band (60) zuverlässig in gegenseitige Anhaftung gebracht sind;

wobei das Verfahren dadurch gekennzeichnet ist, daß der in dem Bereitstellungs-Schritt bereitgestellte Druckmechanismus (61) ein digitaler elektronischer Druckmechanismus (61) ist, der in der Lage ist, auf eine Reihe an den Druckmechanismus (61) ausgegebener digitaler elektronischer Signale hin unbegrenzt variable Zeichen entlang einer durch den Druckmechanismus (61) hindurchgeführten Länge (62) von Bahn-Material aufzudrucken, und daß während des Hindurchführungs-Schrittes eine Reihe digitaler elektronischer Signale an den Druckmechanismus (61) ausgegeben wird, derart, daß der Druckmechanismus (61) verschiedene Zeichen entlang der Längsrichtung der Länge (62) von Bahn-Material aufdruckt, wobei mindestens Teile der Zeichen in einem nichtrepetierenden Muster entlang der Länge (62) von Bahn-Material variiert werden, derart, daß der längliche Streifen in der Rolle Zeichen aufweist und dabei mindestens Teile der Zeichen entlang der Länge des Streifens in einem nichtrepetierenden Muster variieren.

13. Verfahren zum Bilden schraubenförmig gewickelter Rollen nach Anspruch 12, bei dem der Verarbeitungs-Schritt die folgenden Schritte aufweist:

Wickeln der beschichteten und bedruckten Länge (62) von Bahn-Material zu einer Groß-

- rolle;
- Abwickeln der beschichteten und bedruckten Länge (62) von Bahn-Material von der Großrolle; 5
- Schneiden der abgewickelten beschichteten und bedruckten Länge (62) von Bahn-Material in mehrere längliche Streifen; und 10
- Wickeln jedes länglichen Streifens zu einer der Rollen (60) von Band.
14. Verfahren zum Bilden schraubenförmig gewickelter Rollen nach Anspruch 13, bei dem der Verarbeitungs-Schritt die folgenden Schritte aufweist: 15
- Schneiden der beschichteten und bedruckten Länge (62) von Bahn-Material in mehrere längliche Streifen; und 20
- Wickeln jedes länglichen Streifens zu einer der Rollen (60) von Band.
15. Verfahren zum Bilden schraubenförmig gewickelter Rollen nach Anspruch 12, bei dem in dem Beschichtungs-Schritt die Seitenfläche der Länge (62) von Bahn-Material mit wiederpositionierbarem druckempfindlichen Kleber beschichtet wird. 25
16. Verfahren zum Bilden schraubenförmig gewickelter Rollen nach Anspruch 12, bei dem der Beschichtungs-Schritt vor dem Hindurchführungs-Schritt durchgeführt wird. 30
17. Verfahren zum Bilden schraubenförmig gewickelter Rollen nach Anspruch 12, bei dem in dem Beschichtungs-Schritt die Seitenfläche der Länge (62) von Bahn-Material mit permanentem druckempfindlichen Kleber beschichtet wird und der Beschichtungs-Schritt nach dem Hindurchführungs-Schritt durchgeführt wird. 35
18. Verfahren zum Bilden schraubenförmig gewickelter Rollen nach Anspruch 12, bei dem in dem Hindurchführungs-Schritt der Druckmechanismus (61) verschiedene Zeichen entlang beider Seiten der Länge (61) von Bahn-Material aufdruckt. 40
- Revendications** 45
1. Procédé pour former des blocs (10) de feuilles, ledit procédé incluant les étapes consistant à:
- disposer d'un mécanisme d'impression (11) capable d'imprimer des inscriptions (16) le long d'une longueur (12) de matériau en feuille qui passe à travers le mécanisme d'impression 55
- (11);
- revêtir d'un adhésif (14) sensible à la pression une face d'une longueur (12) de matériau en feuille;
- faire passer la longueur (12) de matériau en feuille à travers le mécanisme d'impression (11) tandis que le mécanisme d'impression (11) imprime des inscriptions (16) le long de la longueur (12) de matériau en feuille; et
- convertir la longueur (12), revêtue et imprimée, de matériau en feuille en une pluralité de blocs (10), des portions (26) du revêtement d'adhésif sensible à la pression (14) qui est sur les feuilles faisant adhérer ensemble les feuilles dans les blocs;
- ledit procédé étant caractérisé par le fait que ledit mécanisme d'impression (11) prévu dans ladite étape de mise à disposition est un mécanisme d'impression électronique numérique (11) capable d'imprimer des inscriptions (16) infiniment variables le long d'une longueur (12) de matériau en feuille qui passe à travers le mécanisme d'impression (11), en réponse à une série de signaux électroniques numériques envoyés au mécanisme d'impression (11), et que, durant ladite étape de passage, une série de signaux électroniques numériques sont envoyés au mécanisme d'impression (11) de sorte que le mécanisme d'impression (11) va imprimer des inscriptions variées (16) le long de la longueur (12) du matériau en feuille, au moins des portions des inscriptions (16) étant modifiées selon un motif non répétitif le long de la longueur (12) du matériau en feuille.
2. Procédé pour former des blocs de feuilles (10) selon la revendication 1, dans lequel ladite étape de conversion comporte les étapes consistant à
- découper la longueur imprimée (12) du matériau en feuille en portions (22) d'une dimension prédéterminée;
- empiler les portions (22) pour former une pile primaire (24); et
- découper la pile primaire (24) en portions pour former la pluralité de blocs (10).
3. Procédé pour former des blocs (10) de feuilles selon la revendication 1, dans lequel ladite étape de revêtement revêt d'adhésif sensible à la pression et réutilisable (14) la face de la longueur (12) de matériau en feuille.
4. Procédé pour former des blocs (10) de feuilles selon la revendication 3, dans lequel ladite étape de revêtement se fait avant ladite étape de passage.

5. Procédé pour former des blocs (10) de feuilles selon la revendication 1, dans lequel ladite étape de revêtement revêt d'adhésif sensible à la pression et permanent (14) la face de la longueur (12) de matériau en feuille et dans lequel ladite étape de revêtement se fait après ladite étape de passage. 5
6. Procédé pour former des blocs (10) de feuilles selon la revendication 1, dans lequel, dans ladite étape de passage, le mécanisme d'impression (11) imprime des inscriptions variées (16) le long des deux faces de la longueur (12) de matériau en feuille. 10
7. Procédé pour former une pile primaire (24) à partir de laquelle des blocs (10) de feuilles peuvent être découpées, ledit procédé incluant les étapes consistant à: 15
 - > disposer d'un mécanisme d'impression (11) capable d'imprimer des inscriptions (16) le long d'une longueur (12) de matériau en feuille qui passe à travers le mécanisme d'impression (11); 20
 - > revêtir d'un adhésif (14) sensible à la pression une face d'une longueur (12) de matériau en feuille; 25
 - > faire passer la longueur (12) de matériau en feuille à travers le mécanisme d'impression (11) tandis que le mécanisme d'impression (11) imprime des inscriptions (16) le long de la longueur (12) de matériau en feuille; et 30
 - > découper la longueur imprimée (12) de matériau en feuille en portions d'une dimension prédéterminée; et 35
 - > empiler les portions pour former une pile primaire (24) qui peut être découpée en portions pour former une pluralité de blocs. 40
 - > ledit procédé étant caractérisé par le fait que ledit mécanisme d'impression (11) prévu dans ladite étape de mise à disposition est un mécanisme d'impression électronique numérique (11) capable d'imprimer des inscriptions (16) infiniment variables le long d'une longueur (12) de matériau en feuille qui passe à travers le mécanisme d'impression (11), en réponse à une série de signaux électroniques numériques envoyés au mécanisme d'impression (11), et que, durant ladite étape de passage, une série de signaux électroniques numériques sont envoyés au mécanisme d'impression (11) de sorte que le mécanisme d'impression (11) va imprimer des inscriptions variées (16) le long de la longueur (12) du matériau en feuille, au moins des portions des inscriptions (16) étant modifiées selon un motif non répétitif le long de la longueur (12) du matériau en feuille. 55
8. Procédé pour former une pile primaire (24) selon la revendication 7, dans lequel ladite étape de revêtement revêt d'adhésif sensible à la pression et réutilisable (14) la face de la longueur (12) de matériau en feuille.
9. Procédé pour former une pile primaire (24) selon la revendication 8, dans lequel ladite étape de revêtement se fait avant ladite étape de passage.
10. Procédé pour former une pile primaire (24) selon la revendication 7, dans lequel ladite étape de revêtement revêt d'adhésif sensible à la pression et permanent (14) la face de la longueur (12) de matériau en feuille et dans lequel ladite étape de revêtement se fait après ladite étape de passage.
11. Procédé pour former une pile primaire (24) selon la revendication 7, dans lequel, dans ladite étape de passage, le mécanisme d'impression (11) imprime des inscriptions variées (16) le long des deux faces de la longueur (12) de matériau en feuille.
12. Procédé pour former des rouleaux (60) bobinés en spires de ruban, incluant les étapes consistant à:
 - > disposer d'un mécanisme d'impression (61) capable d'imprimer des inscriptions le long d'une longueur (62) de matériau en feuille qui passe à travers le mécanisme d'impression (61);
 - > revêtir d'un adhésif (63), sensible à la pression une face d'une longueur (62) de matériau en feuille;
 - > faire passer la longueur (62) de matériau en feuille à travers le mécanisme d'impression (61) tandis que le mécanisme d'impression (61) imprime des inscriptions le long de la longueur (62) de matériau en feuille; et
 - > convertir la longueur (62), revêtue et imprimée, de matériau en feuille en une pluralité de rouleaux (60) de ruban comprenant chacun un ruban de forme allongée découpé à partir de la longueur (62) de matériau en feuille et présentant sur une première surface un revêtement d'adhésif sensible à la pression (63) par lequel les spires du ruban imprimé, de forme allongée, du rouleau de ruban (60) adhèrent ensemble, avec possibilité de les détache
 - > ledit procédé étant caractérisé par le fait que ledit mécanisme d'impression (61) prévu dans ladite étape de mise à disposition est un mécanisme d'impression électronique numérique (61) capable d'imprimer des inscriptions infiniment variables le long d'une longueur (62) de matériau en feuille qui passe à travers le mécanisme d'impression (61), en réponse à une série de signaux électroniques numériques

envoyés au mécanisme d'impression (61), et que, durant ladite étape de passage, une série de signaux électroniques numériques sont envoyés au mécanisme d'impression (61) de sorte que le mécanisme d'impression (61) va imprimer des inscriptions variées le long de la longueur (62) du matériau en feuille, au moins des portions des inscriptions étant modifiées selon un motif non répétitif le long de la longueur (62) du matériau en feuille, de sorte que le ruban, de forme allongée du rouleau présente des inscriptions dont au moins des portions des inscriptions varient selon un motif non répétitif le long de sa longueur.

13. Procédé pour former des rouleaux bobinés en hélice selon la revendication 12, dans lequel ladite étape de conversion comporte les étapes consistant à:

- > bobiner la longueur (62), revêtue et imprimée, du matériau en feuilles pour donner un rouleau primaire; et
- > débobiner la longueur (62) revêtue et imprimée, de matériau en feuille, à partir du rouleau primaire;
- > fendre la longueur (62) revêtue et imprimée, débobinée, du matériau en feuille pour donner une pluralité de rubans de forme allongée; et
- > bobiner chacun des rubans de forme allongée pour donner l'un des rouleaux (60) de ruban.

14. Procédé pour former des rouleaux bobinés en spire selon la revendication 13 dans lequel ladite étape de conversion comporte les étapes consistant à:

- > fendre la longueur (62) revêtue et imprimée de matériau en feuille pour une donner une pluralité de rubans de forme allongée; et
- > bobiner chacun des rubans de forme allongée pour donner l'un des rouleaux (60) de ruban.

15. Procédé pour former des rouleaux bobinés en spires selon la revendication 12, dans lequel ladite étape de revêtement revêt d'adhésif sensible à la pression et réutilisable la face de la longueur (62) de matériau en feuille.

16. Procédé pour former des rouleaux bobinés en spires selon la revendication 12, dans lequel ladite étape de revêtement se fait avant ladite étape de passage.

17. Procédé pour former des rouleaux bobinés en spires selon la revendication 12, dans lequel ladite étape de revêtement revêt d'adhésif sensible à la

pression et permanent la face de la longueur (62) de matériau en feuille et dans lequel ladite étape de revêtement se fait après ladite étape de passage.

18. Procédé pour former des rouleaux bobinés en spires selon la revendication 12, dans lequel, dans ladite étape de passage, le mécanisme d'impression (61) imprime des inscriptions variées le long des deux faces de la longueur (62) de matériau en feuille.

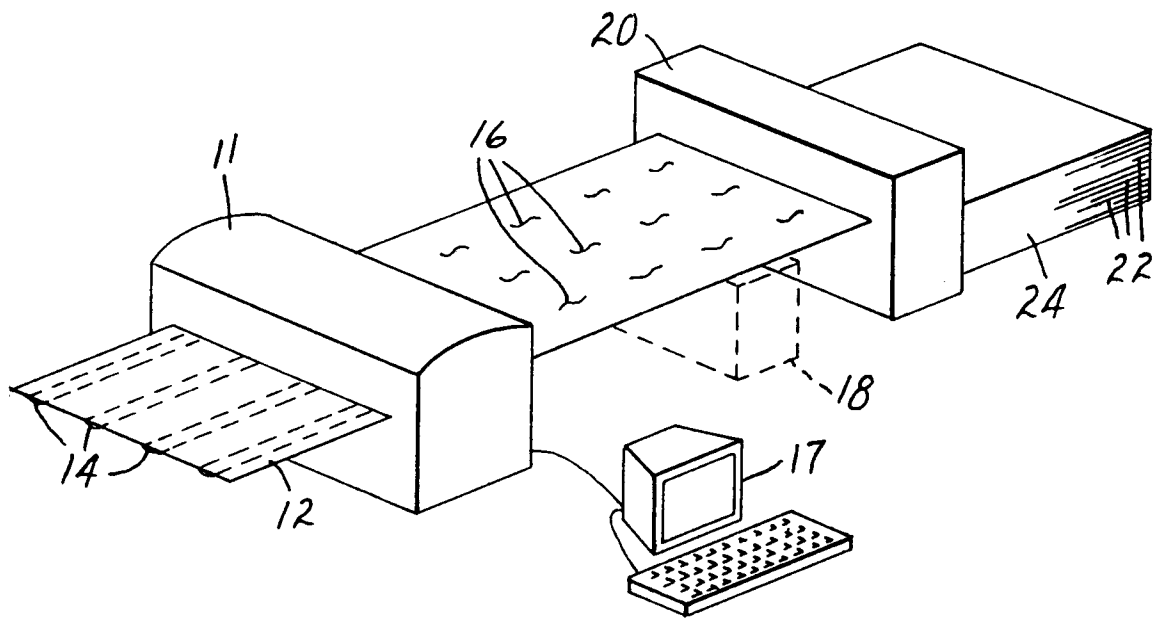


FIG. 1

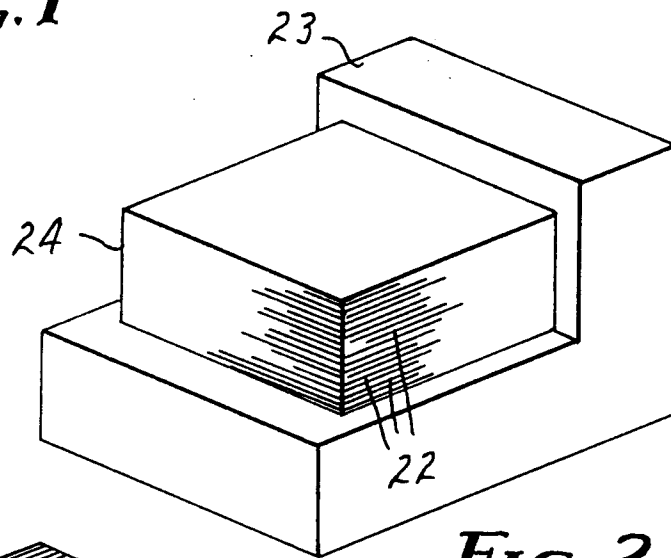


FIG. 2

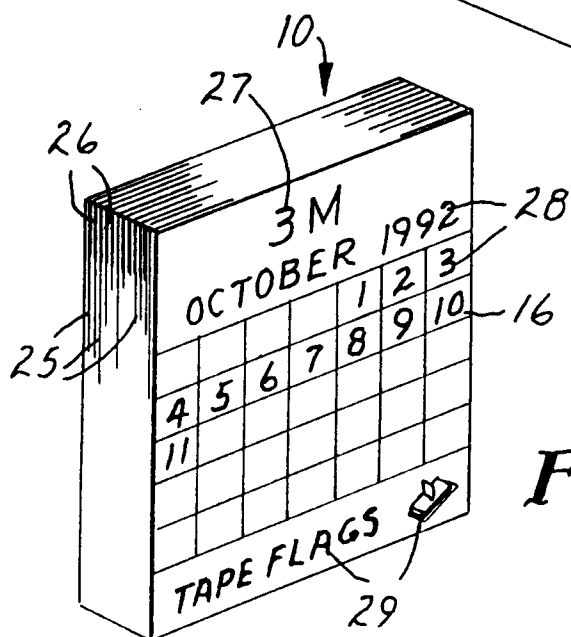
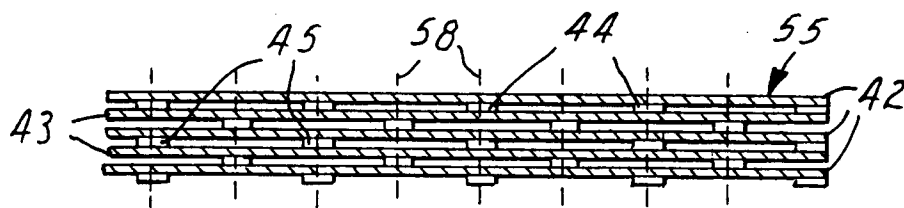
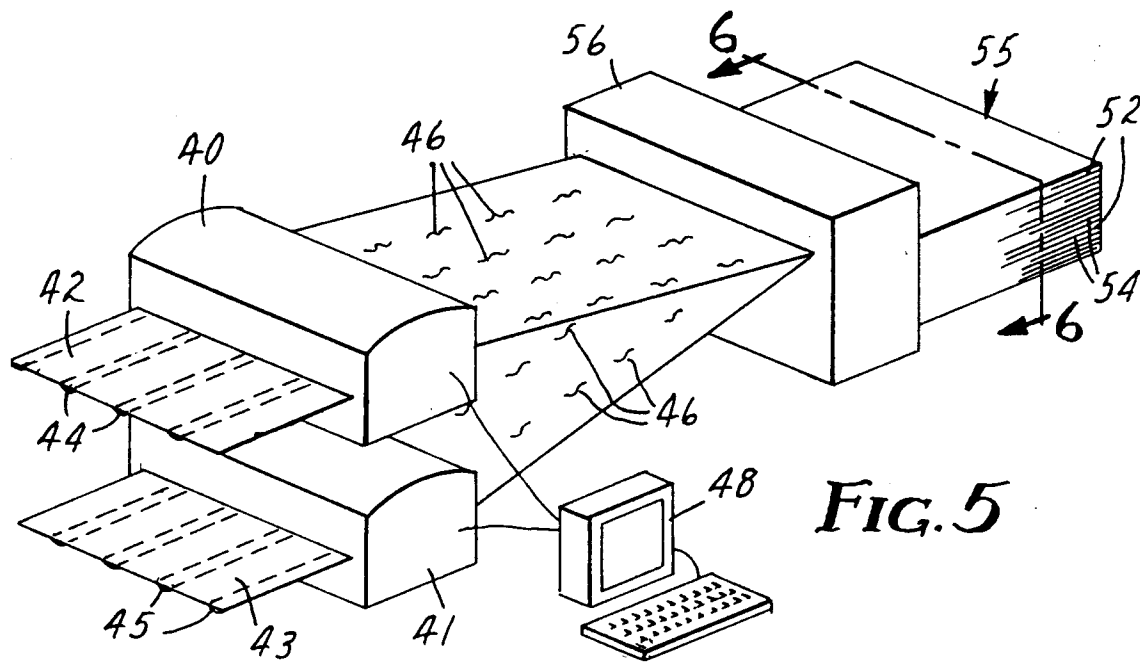
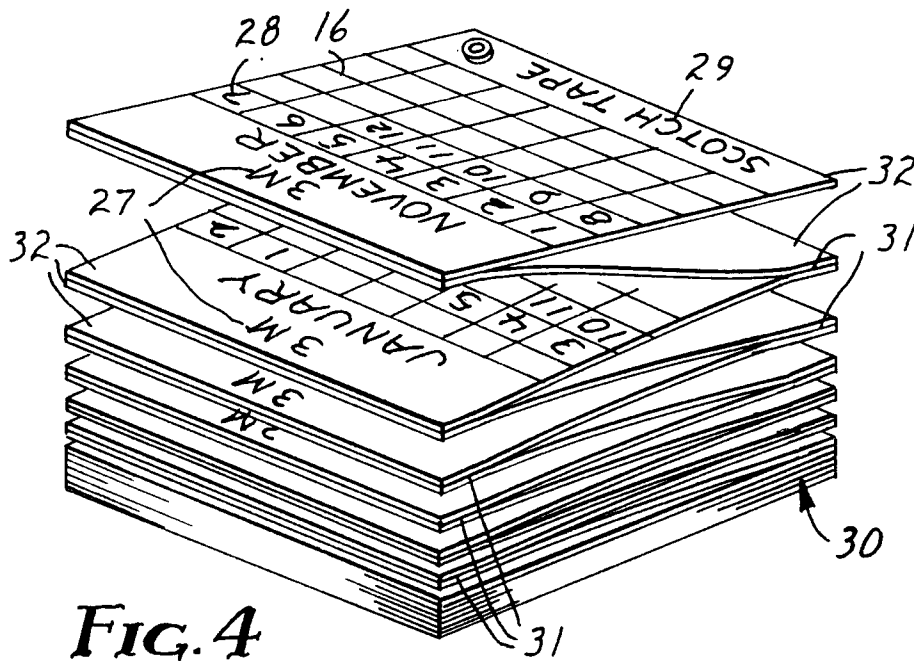
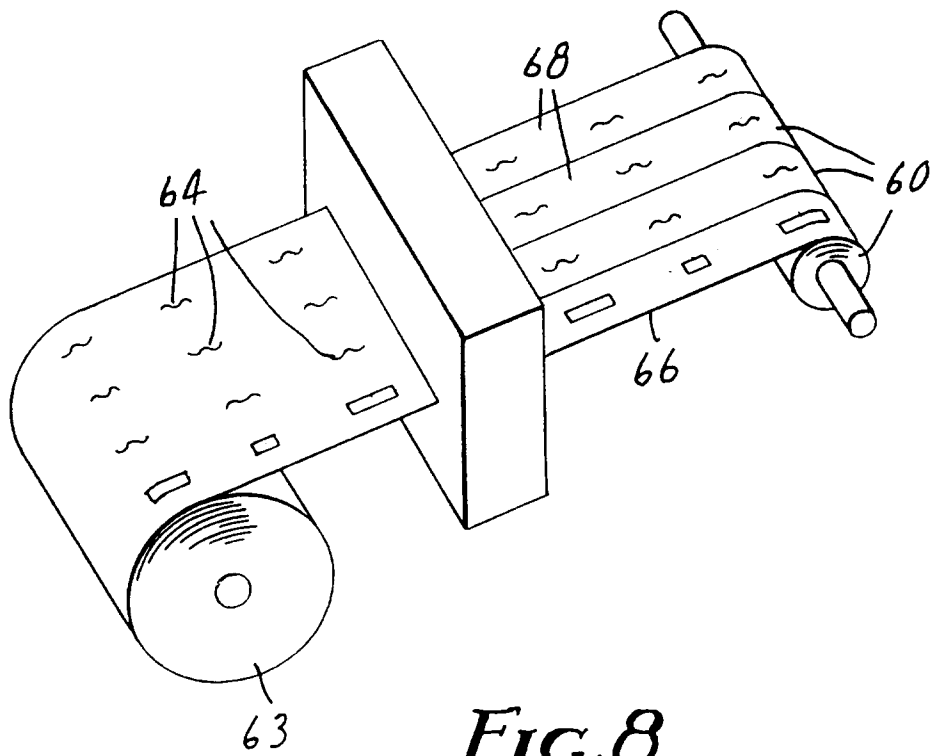
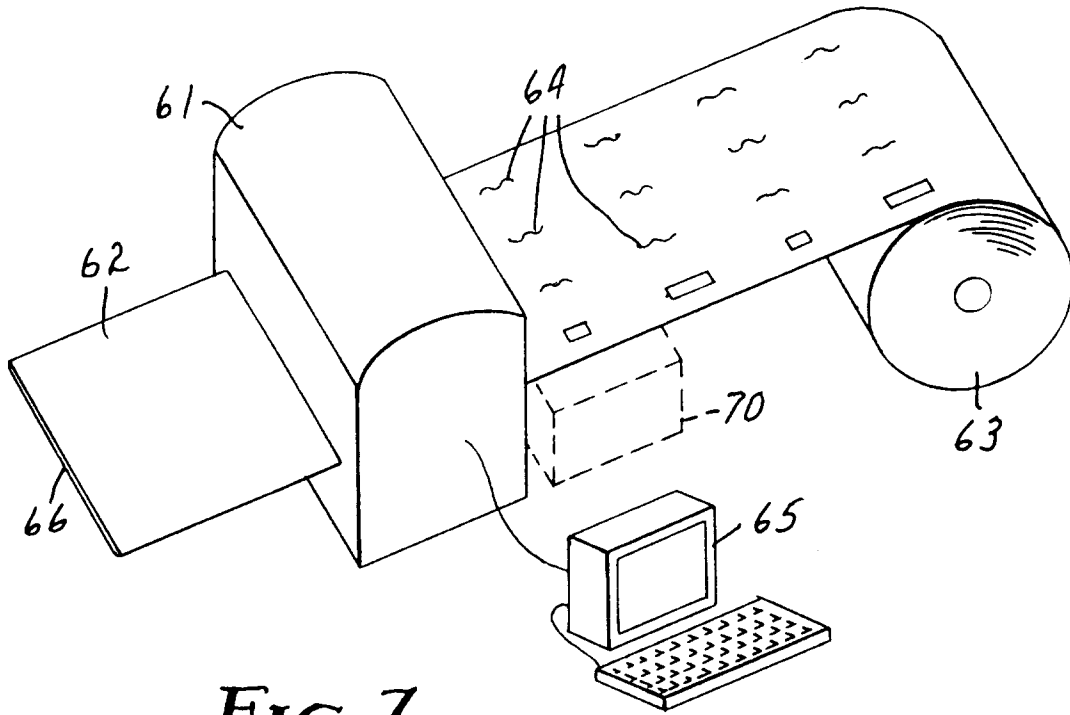


FIG. 3





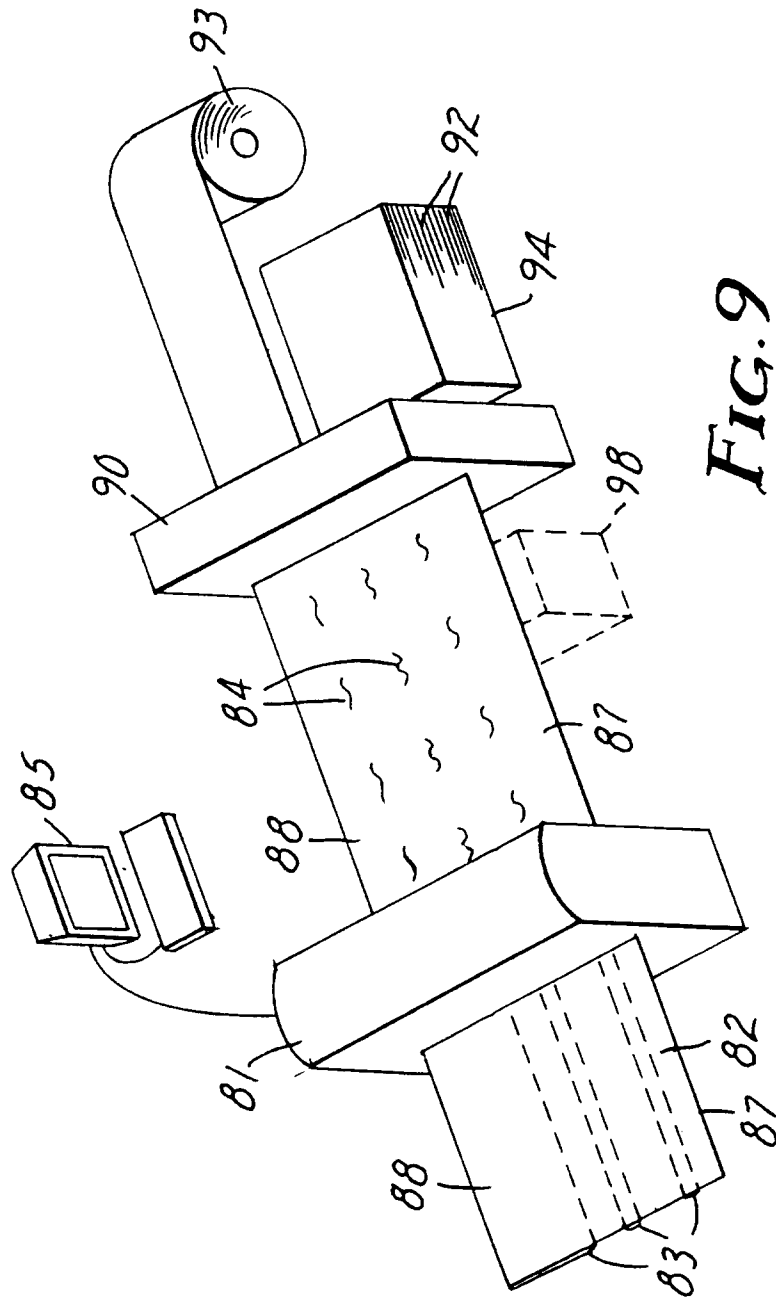


FIG. 9