Abstract: There is provided an apparatus and a method for dispensing printed labels from a printer. The printed labels may be prepared on a need basis, such that each printed label is either held in the apparatus or ejected from the apparatus. Some advantages of the apparatus and method include prolonging a lifespan for a print head, and minimisation of transition error on a media used for printing.
AN APPARATUS AND METHODS FOR DISPENSING AT LEAST ONE SEGMENT OF A PRINTED MEDIA SHEET WITH A PLURALITY OF SEGMENTS

FIELD OF INVENTION

The present invention relates an apparatus and methods for dispensing at least one segment of a printed media sheet with a plurality of segments.

BACKGROUND

Currently, there are printers which do not allow print media to be parked in a printing zone of the printer, and this means that a user would have to conscientiously remove the printed material to prevent damage to the printed material. This is inconvenient to the user.

Furthermore, current printers typically have integrated dispensers which cannot be controlled separately from the printer. This may lead to issues pertaining to either print quality or jammed(crushed) media, which is also undesirable to the user.

In view of the aforementioned, it is evident that there are issues pertaining to the dispensing of printed media for printers nowadays which should be addressed such that inconveniences to the user are minimised.

SUMMARY

In a first aspect, there is provided an apparatus for dispensing at least one segment on a printed media sheet with a plurality of segments. The apparatus may be coupled to a printer, with a printer head of the printer being capped when the at least one segment is held at a predetermined position.
The apparatus includes a first detector being configured for determining a presence of the at least one segment; a driving mechanism for moving the media sheet; an output drive roller; a movable structure for contacting a second surface of the media sheet, the movable structure being able to grip the media sheet together with the output drive roller; and a second detector being configured for determining a mode of the movable structure, the mode including a non-contact mode and a contact mode. The at least one segment may be a printed label.

It is advantageous that the movable structure is configured to contact the second surface of the media sheet when the first detector determines the presence of the at least one segment at a predetermined position, the predetermined position being at a dispensing opening, and when the second detector determines the contact mode of the movable structure.

The first detector preferably includes either a light sensor or a load sensor. In addition, the at least one segment is singuiated from the media sheet when the at least one segment is held at the predetermined position. The second detector may be a sensor which is configured to be triggered when the movable structure is in one of the modes.

The driving mechanism may be configured to back-track the media sheet when the at least one segment is singuiated from the media sheet. The output drive roller may be configured to move in a single direction, the single direction being enabled when the output drive roller is coupled to a one-way clutch.

It is preferable that the non-contact mode is when the movable structure is not in contact with the second surface of the media sheet and the contact mode being when the movable structure is in contact with the second surface of the media sheet. It is also preferable that movement of the movable structure is modulated with a biasing mechanism.
The at least one segment may be ejected subsequent to being held at the predetermined position.

In a second aspect, there is provided a method for dispensing at least one segment on a printed media sheet with a plurality of segments in a dispenser of the at least one segment.

The method includes printing on at least one segment of the media sheet at a print zone; singuiating the at least one printed segment of the media sheet; holding onto the at least one printed segment of the media sheet; and capping the print head at the print zone when the at least one printed segment is held beyond a predetermined period of between five and thirty seconds. The at least one printed segment is a printed label and it is advantageous that capping the print head minimizes exposure of the print head.

The method may further include either ejecting or removing the at least one printed segment of the media sheet and retreating of the media sheet away from the print zone.

In a final aspect, there is provided a method for dispensing at least one segment on a printed media sheet with a plurality of segments in the aforementioned apparatus. The method includes detecting a presence of the at least one segment at a predetermined position, the predetermined position being at a dispensing opening; detecting a contact mode of the movable structure of the apparatus; and holding onto the at least one printed segment of the media sheet at the predetermined position.

The method further may include either ejecting or removing the at least one printed segment of the media sheet. The at least one printed segment is preferably a printed label.

DESCRIPTION OF FIGURES
In order that the present invention may be fully understood and readily put into practical effect, there shall now be described by way of non-limitative example only preferred embodiments of the present invention, the description being with reference to the accompanying illustrative figures.

Figure 1 shows a top perspective view of a preferred embodiment of an apparatus of the present invention.
Figure 2 shows a bottom perspective view of Figure 1.
Figure 3 shows a first perspective view of a media sheet drive system of Figure 1.
Figure 4 shows a second perspective view of the media sheet drive system of Figure 1.
Figure 5 shows a close up of a second sensor when a movable structure of Figure 1 is at a non-contact mode.
Figure 6 shows a close up of a second sensor when a movable structure of Figure 1 is at a contact mode.
Figure 7 shows a process flow of a preferred embodiment of a first method of the present invention.
Figure 8 shows a process flow of a preferred embodiment of a second method of the present invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Embodiments of the present invention, as described hereinafter, relate to an apparatus and a method for dispensing printed labels from a printer. Embodiments of the invention may be employed in circumstances where printed labels are prepared on a need basis, such that each printed label is either held in the apparatus or ejected from the apparatus.
Some advantages of the invention which will be evident from the disclosure of the subsequent paragraphs include prolonging a lifespan for a print head, and minimisation of transition error on a media used for printing.

Figures 1 and 2 provide perspective views of a preferred embodiment of the apparatus of the present invention. Figures 3 to 6 provide detailed views of certain portions of the apparatus of the present invention.

Referring to Figures 1 and 2, there is provided an apparatus 20 for dispensing at least one segment 26 on a printed media sheet 22. The apparatus 20 may be coupled to a printer (not shown). The media sheet 22 may be at least one layer for receiving print content, such as, for example, a sheet of paper, a sheet of individual labels, a sheet of paper with perforations and so forth. The media sheet 22 may be provided in a form of a cylindrical roll, a fan-fold configuration or an edge-to-edge separable form.

The apparatus 20 includes a first detector 24 which is configured for determining a presence of the at least one segment 26 at a dispensing opening. The first detector 24 is either a light sensor which detects light when the at least one segment 26 is removed or a load sensor which detects removal of a load when the at least one segment 26 is removed. The at least one segment 26 should be in contact with the load sensor when the load sensor is used. However, the at least one segment 26 need not be in contact with the light sensor when the light sensor is used. In addition, the light sensor may not be effective when the at least one segment 26 is made from a material which allows light to pass through.

There is also a driving mechanism 28 included with the apparatus 20. The driving mechanism 28 is configured to move the media sheet 22 and correspondingly, the at least one segment 26, through the apparatus 20. The driving mechanism 28 includes an output drive roller 30 for contacting a first surface 32 of the media sheet 22 and for moving the media sheet 22. The
output drive roller 30 is configured to move in a single direction, the single
direction being enabled when the output drive roller 30 is coupled to a one-way
clutch. Contacting the first surface 32 of the media sheet 22 with the output
drive roller 30 provides frictional contact to enable movement of the media
sheet 32. The driving mechanism 28 also includes a gear train 34 and a belt
drive which will be described in greater detail at a subsequent section. Finally,
the driving mechanism 28 is driven by a connected printer motor (not shown) in
a manner which will also be described in greater detail at a subsequent section.

The apparatus 20 also includes a movable structure 40 for contacting a second
surface 42 of the media sheet 32. Movement of the movable structure 40 may
be modulated with a biasing mechanism, such as, for example, a torsion spring.
The movable structure 40 is able to grip the media sheet 22 together with the
output drive roller 30. There is a second detector 44 which is configured for
determining a mode of the movable structure 40. The movable structure 40 is
either in a non-contact mode or in a contact mode, the non-contact mode being
when the movable structure 40 is not in contact with the second surface 42 of
the media sheet 22 and the contact mode being when the movable structure 40
is in contact with the second surface 42 of the media sheet 22. The biasing
mechanism aids in maintaining a position of the movable structure 40 when the
movable structure 40 is in the contact mode. It should be appreciated that the
movable structure 40 can also include rollers, whereby the rollers are the only
portions of the movable structure 40 which contact the second surface 42 of the
media sheet 22. The rollers aid in the movement of the media sheet 22. The
rollers are visible in Figure 5 (labeled as 64).

The second detector 44 is configured to determine the mode of the movable
structure 40 using either direct or indirect motion of the movable structure 40.
The second detector 44 is a sensor which is configured to be triggered when
the movable structure 40 is in one of the modes. Further details of the second
detector 44 will be provided in a subsequent section.
In the preferred embodiment, the movable structure 40 contacts the second surface 42 of the media sheet 22 when the first detector 24 determines the presence of the at least one segment 26 at a predetermined position, the predetermined position being at a dispensing opening. The at least one segment 26 may be singulated from the media sheet 22 when the at least one segment 26 is held at the predetermined position in the apparatus 20. The singulation of the at least one segment 26 from the media sheet 22 is carried out by either tearing or cutting of the at least one segment 26 from the media sheet 22. Tearing of the at least one segment 26 may be carried out by a user of the at least one segment 26 while cutting of the at least one segment 26 may be carried out either within the apparatus 20 or the printer. The at least one segment 26 may be ejected subsequent to being held at the predetermined position. For example, the output drive roller 30 may rotate and cause the at least one segment 26 which has been singulated to be removed from the apparatus 20. Furthermore, the driving mechanism 28 is also configured to back-track the media sheet 22 when the at least one segment 26 is singulated from the media sheet 22. It should be appreciated that a printer head of the printer is able to be capped when the at least one segment 26 is held at the predetermined position after the media sheet 22 has been back-tracked. Capping the printer head minimizes exposure time of the printer head and prolongs the life of the printer head.

The preceding paragraphs relating to Figures 1 and 2 provide an overview of the apparatus 20. Figures 3 to 6 support detailed descriptions for the main aspects of the apparatus 20. Specifically, Figures 3 and 4 support detailed descriptions for the driving mechanism 28 while Figures 5 and 6 support detailed descriptions for how the second sensor 44 operates.

Referring to Figure 3 which shows the drive mechanism 28 when the output drive roller 30 is driven by the printer motor coupled to a media sheet roller 52 in an anti-clockwise direction (viewed from direction A), a belt drive 50 coupled to the media sheet roller 52 moves in an anti-clockwise direction. A third gear 34(c)
of the gear train 34 which is coupled to the belt drive 50 also moves in an anti-clockwise direction. When the third gear 34(c) moves in an anti-clockwise direction, a second gear 34(b) of the gear train 34 moves in a clockwise direction and a first gear 34(a) moves in an anti-clockwise direction. In this embodiment, the belt drive 50 is coupled to a media sheet 22 roller 52 which moves in an anti-clockwise direction to feed a leading edge of a roll of the media sheet 22 towards the output drive roller 30. This paragraph describes how the media sheet 22 is fed to the output drive roller 30. The media sheet 22 is fed to the output drive roller 30 when the first sensor 24 detects removal of the at least one segment 26 from the apparatus 20. In this regard, once the first sensor 24 detects removal of the at least one segment 26 from the apparatus 20, the printer motor is activated to drive the media sheet roller 52 in an anti-clockwise direction.

Referring to Figure 4, there is shown workings of the drive mechanism 28 when the media sheet 22 is back-tracked after singulation of the at least one segment 26. The output drive roller 30 includes a one-way clutch such that it only rotates in a single direction (the direction mentioned in the preceding paragraph). However, when the printer motor reverses direction from that of the preceding paragraph (clockwise direction viewed from direction A), the belt drive 50 coupled to the media sheet roller 52 also moves in a clockwise direction and consequently, the third gear 34(c) moves in a clockwise direction. Consequently, the second gear 34(b) of the gear train 34 moves in an anti-clockwise direction and the first gear 34(a) of the gear train 34 moves in a clockwise direction.

When the media sheet 22 roller 52 moves in a clockwise direction, the output drive roller 30 does not rotate and this enables retraction of a leading edge of a roll of the media sheet 22 away from the output drive roller 30.

Referring to Figure 5, there is shown a close up view of the second sensor 44 when the movable structure 40 is in the non-contact mode. The movable structure 40 is in the non-contact mode when the first detector 24 detects removal of the at least one segment 26. A DC motor 38 drives a worm gear 60.
The worm gear 60 consequently engages a cam 62, the cam 62 having a first half 62(a) and a second half 62(b). Referring back to a directional conventions of the detailed description for Figures 3 and 4, when the output drive roller 30 is driven in an anti-clockwise direction, the cam 62 moves in an anti-clockwise direction (viewed from direction B) such that the second half 62(b) consequently lifts the movable structure 40 as the leading edge of the media sheet 22 is fed towards the output drive roller 30 after the first detector 24 detects removal of the at least one segment 26. The first half 62(a) simultaneously triggers a lever 44(a) of the second sensor 44 such that the apparatus 20 is able to determine the mode of the movable structure 40.

Referring to Figure 6 which also refers back to the directional conventions of the detailed description for Figures 3 and 4, the output drive roller 30 stops rotating (following on from Figure 5) as the media sheet 22 stops moving. This may occur after the at least one segment 26 is singulated from the media sheet 22. The cam 62 continues to move in an anti-clockwise direction (viewed from direction B) such that the second half 62(b) consequently stops supporting the movable structure 40. The first half 62(a) simultaneously releases the lever 44(a) of the second sensor 44 such that the movable structure 40 is in a contact mode.

When the at least one segment 26 is removed from the apparatus 20, the first sensor 24 consequently instructs the apparatus 20 to initiate the operations as described using Figures 3 and 6.

It should be appreciated that the non-contact mode of the movable structure 40 ensures minimisation of transition error on the media sheet 22 used for printing.

Referring to Figure 7, there is shown a first method 100 for dispensing at least one segment 26 on the printed media sheet 22 in the apparatus 20. It should be appreciated that the method 100 may also be usable for other dispenser devices. The method 100 includes printing on at least one segment 26 of the
media sheet 22 (102). Subsequently, the method 100 includes singulating the at least one printed segment 26 of the media sheet 22 (104). The singulation of the at least one segment 26 from the media sheet 22 is carried out by either tearing or cutting of the at least one segment 26 from the media sheet 22. Tearing of the at least one segment 26 may be carried out by a user of the at least one segment 26 while cutting of the at least one segment 26 may be carried out either within the apparatus 20 or the printer.

The method 100 also includes retreating of the media sheet 22 (the remainder media sheet 22 excluding the at least one segment 26) away from a print zone (105). This clears an area around the print zone. In addition, the method 100 includes determining if the movable structure 40 is in a contact mode (106). This is carried out using the second sensor 44 as described earlier with reference to Figures 5 and 6. If the movable structure 40 is not in the contact mode, the movable structure 40 will then be engaged to contact mode (108).

Subsequently, the method 100 includes determining if the first detector 24 (as described in the preceding paragraphs) is de-activated (110). If the first detector 24 is de-activated, it means that the at least one segment 26 has been either ejected or removed from the apparatus 20 (112). After the at least one segment 26 has been ejected or removed from the apparatus 20, the method 100 may restart again to the printing on at least one segment 26 of the media sheet 22 (102). However, if the first detector 24 is not de-activated, a timer in the apparatus 20 determines if a predetermined time has elapsed (114). The predetermined time may be, for example, any duration between five to thirty seconds. If the predetermined time has elapsed, it would indicate that the at least one segment 26 is being held at the apparatus 20, and the printer head is capped (116) to minimize exposure of the print head. If the predetermined time has not elapsed, it means that the first detector 24 has been de-activated (110).

Referring to Figure 8, there is shown a second method 150 for dispensing at least one segment 26 on the printed media sheet 22 in the apparatus 20. It
should be appreciated that the second method 150 involves a process carried out by the apparatus 20. The method 150 includes detecting a presence of the at least one segment 26 at a predetermined position, the predetermined position being at a dispensing opening (152). The detection of the presence of the at least one segment 26 may be carried out using the first sensor 24. The method 150 also includes detecting a contact mode of the movable structure 40 of the apparatus 20 (154). The detection of the contact mode may be carried out using the second sensor 44. In addition, the method 150 also includes holding onto the at least one printed segment 26 of the media sheet 22 at the predetermined position (156). Finally, the method 150 includes ejecting or removing the at least one segment 26 from the apparatus 20 (158).

It should be appreciated that the methods 100, 150 denote process flows which utilizes the various aspects of the apparatus 20 as described earlier. Correspondingly, usage of the methods 100, 150 also provide identical benefits as usage of the apparatus 20.

Whilst there has been described in the foregoing description preferred embodiments of the present invention, it will be understood by those skilled in the technology concerned that many variations or modifications in details of design or construction may be made without departing from the present invention.
CLAIMS

1. An apparatus for dispensing at least one segment on a printed media sheet with a plurality of segments, the apparatus including:
   a first detector being configured for determining a presence of the at least one segment;
   a driving mechanism for moving the media sheet;
   an output drive roller;
   a movable structure for contacting a second surface of the media sheet, the movable structure being able to grip the media sheet together with the output drive roller; and
   a second detector being configured for determining a mode of the movable structure, the mode including a non-contact mode and a contact mode, wherein the movable structure is configured to contact the second surface of the media sheet when the first detector determines the presence of the at least one segment at a predetermined position, the predetermined position being at a dispensing opening, and when the second detector determines the contact mode of the movable structure.

2. The apparatus as claimed in claim 1, wherein the first detector includes a light sensor or a load sensor.

3. The apparatus as claimed in either claim 1 or 2, wherein the at least one segment is singulated from the media sheet when the at least one segment is held at the predetermined position.

4. The apparatus as claimed in claim 3, wherein the driving mechanism is configured to back-track the media sheet when the at least one segment is singulated from the media sheet.

5. The apparatus as claimed in any one of claims 1 to 4, wherein the non-contact mode being when the movable structure is not in contact with the
second surface of the media sheet and the contact mode being when the movable structure is in contact with the second surface of the media sheet.

6. The apparatus as claimed in any one of claims 1 to 5, wherein the second detector is a sensor which is configured to be triggered when the movable structure is in one of the modes.

7. The apparatus as claimed in any one of claims 1 to 6, wherein the at least one segment is a printed label.

8. The apparatus as claimed in any one of claims 1 to 7, wherein movement of the movable structure is modulated with a biasing mechanism.

9. The apparatus as claimed in any one of claims 1 to 8, wherein the at least one segment is ejected subsequent to being held at the predetermined position.

10. The apparatus as claimed in any one of claims 1 to 9, wherein the output drive roller is configured to move in a single direction, the single direction being enabled when the output drive roller is coupled to a one-way clutch.

11. The apparatus as claimed in any one of claims 1 to 10 being coupled to a printer, a printer head of the printer being capped when the at least one segment is held at the predetermined position.

12. A method for dispensing at least one segment on a printed media sheet with a plurality of segments in a dispenser of the at least one segment, the method including:
   printing on at least one segment of the media sheet at a print zone;
   singulating the at least one printed segment of the media sheet;
   holding onto the at least one printed segment of the media sheet; and
capping the print head at the print zone when the at least one printed segment is held beyond a predetermined period.

13. The method as claimed in claim 12, further including either ejecting or removing the at least one printed segment of the media sheet.

14. The method as claimed in either claim 12 or 13, further including retreating of the media sheet away from the print zone.

15. The method as claimed in any one of claims 12 to 14, wherein the at least one printed segment is a printed label.

16. The method as claimed in any one of claims 12 to 15, wherein capping the print head minimizes exposure of the print head.

17. The method as claimed in any one of claims 12 to 16, wherein the predetermined period is between five and thirty seconds.

18. A method for dispensing at least one segment on a printed media sheet with a plurality of segments in the apparatus as claimed in any one of claims 1 to 11, the method including:

   detecting a presence of the at least one segment at a predetermined position, the predetermined position being at a dispensing opening;

   detecting a contact mode of the movable structure of the apparatus; and

   holding onto the at least one printed segment of the media sheet at the predetermined position.

19. The method as claimed in claim 18, further including either ejecting or removing the at least one printed segment of the media sheet.

20. The method as claimed in either claim 18 or 19, wherein the at least one printed segment is a printed label.
Figure 6
Printing on at least one segment 26 of media sheet 22 → 102

Singulating the at least one printed segment 26 of media sheet 22 → 104

Retreating of media sheet 22 away from print zone → 105

Movable structure 40 in contact mode? No → Engage movable structure 40 to contact mode → 106

Yes → Capping the print head

First detector 24 de-activated? No → Has a predetermined time elapsed? Yes → Ejecting/removing the at least one printed segment 26

Yes → 110

No → 114

Figure 7

SUBSTITUTE SHEET (RULE 26)
Detecting a presence of the at least one segment 26 at a predetermined position

Detecting a contact mode of the movable structure 40 of the apparatus 20

Holding onto the at least one printed segment 26 of the media sheet 22 at the predetermined position

Ejecting/ removing the at least one printed segment 26

Figure 8
INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG2013/000012

A. CLASSIFICATION OF SUBJECT MATTER

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

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)

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 practicable, search terms used)

Databases : EPODOC, WPI, GOOGLE PATENTS, ESPACENET

Keywords: Label, sticker, web, dispenser, rotary, printer, sensor, detector, monitor, grip, segment, perforation, splice, cut, continue, reverse, stagnant, mark and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<th>Category*</th>
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<td>Further documents are listed in the continuation of Box C</td>
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Documents are listed in the continuation of Box C

* Special categories of cited documents:
  "A" document defining the general state of the art which is not considered to be of particular relevance
  "E" earlier application or patent or published on or after the international filing date
  "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  "O" document referring to an oral disclosure, use, exhibition or other means
  "P" document published prior to the international filing date but later than the priority date claimed
  "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
  "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is considered alone
  "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
  "&" document member of the same patent family

Date of the actual completion of the international search
15 April 2013

Date of mailing of the international search report
15 April 2013

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Form PCT/ISA/210 (fifth sheet) (July 2009)
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<td>WO 1985/004503 A1 (NCR CORPORATION) 10 October 1985 Pages 5, 8 - 9, 12 - 15, 25 - 26, Figure 3</td>
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<td>Y</td>
<td>EP 2380745 A2 (ILLINOIS TOOL WORKS INC.) 26 October 2011 [0004 - 0009], [0026], [0032], [0051 - 0054], Abstract</td>
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<td>IP 2000177190 A (COPYER CO LTD) 27 June 2000 Whole Document</td>
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### Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. **H** Claims Nos.:  
   because they relate to subject matter not required to be searched by this Authority, namely:

2. **Q** Claims Nos.:  
   because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. **H** Claims Nos:  
   because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

### Box No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

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1. **☐** As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. **H** As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. **☐** As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. **X** No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
   1 - 11 & 18 - 20

### Remark on Protest

- **☐** The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- **H** The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- **H** No protest accompanied the payment of additional search fees.
Continuation of: Box III

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

- Claims 1 - 11 & 18 - 20. The feature of the first and second detector, and said relationship between the detectors and a movable structure is specific to this group of claims.

- Claims 12 - 17. The feature of capping the print head at the print zone when the at least one printed segment is held beyond a predetermined period is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. The only feature common to all of the claimed inventions and which provides a technical relationship among them is

- Dispensing at least one segment on a printed media sheet with a plurality of segments
- Holding or gripping the media sheet

However it is considered that this feature is generic in this particular art. Therefore in this light this common feature cannot be a special technical feature. Hence there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied a priori.
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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