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(71) Applicant: **Corelex Shin-Ei Co., Ltd.**
Fuji-shi, Shizuoka 421-3306 (JP)

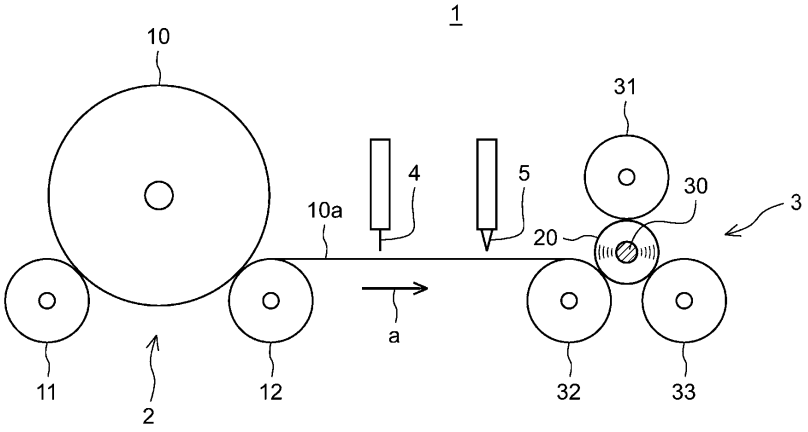
(72) Inventor: **KUROSAKI, Satoshi**
Fuji-shi, Shizuoka 421-3306 (JP)

(74) Representative: **Strehl Schübel-Hopf & Partner**
Maximilianstrasse 54
80538 München (DE)

(54) TOILET PAPER AND TOILET PAPER MANUFACTURING METHOD

(57) The present disclosure provides a toilet paper roll of which the position of a row of perforations can be found correctly and also provides a method of manufacturing the toilet paper roll. A perforation cutter 4 forms the row of perforations in a raw paper strip 10a pulled out from a raw paper roll 10, and marking nozzles 5 apply a prescribed liquid to the raw paper strip 10a to form marks at the row of perforations and at end portions of a paper strip of the toilet paper roll in the cross direction. The raw paper strip 10a is wound up in a winding unit 3. The toilet paper rolls are manufactured from this raw paper strip 10a.

FIG.1



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Description

[Technical Field]

[0001] The present disclosure relates to a toilet paper roll having a mark for indicating the position of a row of perforations and also to a method of manufacturing the toilet paper roll.

[Background Art]

[0002] A toilet paper roll is formed by winding a paper strip. A type of toilet paper roll has rows of perforations formed on the paper strip at predetermined intervals in the longitudinal direction of the paper strip. The rows of perforations are provided to facilitate easy cutting. The toilet paper roll is normally made white, which makes it difficult to visually find the row of perforations quickly. Thus, the paper strip may be torn where the row of perforations is not formed. A type of toilet paper roll has colored marks to indicate the position of the row of perforations.

[0003] For example, the PTL 1 discloses a toilet paper roll having a colored portion formed on the paper strip around cutting lines (i.e., a row of perforations). The colored portion may be a belt-like colored mark formed so as to surround the cutting line or may be a dotted colored mark formed so as to extend parallel to the cutting line at the upper or lower side thereof. PTL 2 discloses a toilet paper roll of which a blue line or characters or a pattern is printed parallel to the row of perforations on the paper strip.

[0004] PTL 3 discloses a toilet paper roll of which through-holes and marks are formed on the paper strip so that a visually handicapped person or an aged person can find the position of the row of perforations easily. For example, in this toilet paper roll, a green mark is printed at the position of the row of perforations and a notch or a through-hole is also formed at the position of the row of perforations. The notch or the through-hole helps a user to pull out a regular length of the paper strip from the toilet paper roll.

[Citation List]

[Patent Literature]

[0005]

[PTL 1] Japanese Registered Utility Model No. 3140786
[PTL 2] Japanese Unexamined Patent Application Publication No. 2012-130636
[PTL 3] Japanese Registered Utility Model No. 3093320

[Summary of Invention]

[Technical Problem]

[0006] A known toilet paper roll has the marks or the like formed near the row of perforations. A user can find an approximate position of the row of perforations but may have difficulty in finding the exact position. Accordingly, the user may tear the paper strip at a position other than the row of perforations and may obtain a piece of paper not having a desired size and shape.

[0007] Another known toilet paper roll has a line or characters printed on the paper strip so as to surround the row of perforations or so as to extend parallel to the row of perforations, which requires a considerable amount of ink to be applied to the paper strip. The ink permeates into the paper fibers and the water contained therein weakens the fiber bonding at the application portion. Accordingly, it is necessary to provide a step of drying the ink before the paper strip is wound into a roll. In the drying step, it is also necessary to dry a portion of the paper strip extending almost between opposite edges thereof in the cross direction. In the case of forming the notch or the through-hole at the row of perforations, the manufacturing machine needs to be equipped with a cutter for forming the notch or the through-hole in addition to a perforation cutter for forming the row of perforations. Accordingly, it becomes difficult to suppress an increase in the cost of manufacturing known types of toilet paper rolls, such as those having marks for indicating the position of the row of perforations, which leads to an increase in the sales price.

[0008] The present disclosure is made in such circumstances, and an object of the present disclosure is to provide a toilet paper roll of which the position of the row of perforations can be found correctly and also to provide a method of manufacturing the toilet paper roll.

[Solution to Problem]

[0009] According to the present disclosure, a toilet paper roll is formed by winding a paper strip into a roll. The toilet paper roll includes a row of perforations formed so as to extend in a cross direction of the paper strip and also includes marks formed on the row of perforations and indicating a position of the row of perforations. The marks are formed at opposite end portions of the paper strip in the cross direction.

[0010] In the toilet paper roll of the present disclosure, the marks may be colored.

[0011] In the toilet paper roll of the present disclosure, the marks may cause adjacent layers of the paper strip to adhere to each other. In addition, when the paper strip is pulled out from the toilet paper roll and the adjacent layers are separated, the adhesion strength of the marks may generate resistance.

[0012] In the toilet paper roll of the present disclosure, the marks may be formed only at opposite end portions of

the paper strip in the cross direction.

[0013] In the toilet paper roll of the present disclosure, the marks may be formed at opposite edge portions of the paper strip in the cross direction.

[0014] According to the present disclosure, a method of manufacturing toilet paper rolls includes a first step of forming a row of perforations on a raw paper strip pulled out from a raw paper roll, the row of perforations extending in a cross direction of the raw paper strip, a second step of applying a prescribed liquid onto the raw paper strip at a position of the row of perforations, and a third step of obtaining toilet paper rolls by cutting a roll formed by winding the raw paper strip to which the prescribed liquid has adhered. In the second step, the prescribed liquid is applied to the raw paper strip to form marks at positions corresponding to opposite end portions in the cross direction of each one of the toilet paper rolls to be obtained by cutting the roll of the raw paper strip in the third step.

[0015] In the method of manufacturing toilet paper rolls of the present disclosure, in the second step, multiple nozzles that are arranged so as to extend in the cross direction of the raw paper strip may discharge the prescribed liquid to cause the prescribed liquid to adhere to the raw paper strip at the position of the row of perforations.

[0016] In the method of manufacturing toilet paper rolls of the present disclosure, in the second step, the prescribed liquid having an arbitrary color may be applied onto the raw paper strip.

[Advantageous Effects of Invention]

[0017] The toilet paper roll of the present disclosure has the marks formed at the opposite end portions of the paper strip and on the row of perforations, which enables a user to find the position of the row of perforations easily.

[0018] According to the method of manufacturing toilet paper rolls of the present disclosure, the toilet paper roll that enables the user to find the position of the row of perforations easily can be manufactured while an increase in the manufacturing is suppressed.

[Brief Description of Drawings]

[0019]

Fig. 1 is a diagram outlining the structure of a toilet paper manufacturing machine for manufacturing toilet paper rolls according to the present disclosure.
Fig. 2 is a diagram illustrating a part of the toilet paper manufacturing machine in which marking nozzles are disposed, the marking nozzles forming marks on a raw paper strip being transported from a raw paper feeding unit to a winding unit.
Fig. 3 is a diagram illustrating a roll formed by winding the raw paper strip in the winding unit.
Fig. 4 is a perspective view illustrating the exterior of a toilet paper roll according to the present disclosure.
Fig. 5 is a perspective view illustrating the exterior of another example of a toilet paper roll according to the present disclosure.

[Description of Embodiment]

[0020] An embodiment of the present invention will be described as follows.

[Embodiment]

[0021] Fig. 1 is a diagram outlining the structure of a toilet paper manufacturing machine 1 for manufacturing toilet paper rolls according to an embodiment of the present disclosure. Fig. 1 illustrates a part of the toilet paper manufacturing machine 1 in which a paper strip having rows of perforations and marks is wound up. The paper strip is provided by unwinding a raw paper roll 10 manufactured in a process of which the illustration is omitted. As illustrated in Fig. 1, the toilet paper manufacturing machine 1 includes a raw paper feeding unit 2, a winding unit 3, a perforation cutter 4, and a marking nozzle 5.

[0022] The raw paper roll 10 is a roll of a raw paper strip 10a having a width of multiple rolls of toilet paper, such as toilet paper rolls 21 (to be described later). The raw paper roll 10 is placed in the raw paper feeding unit 2 of the toilet paper manufacturing machine 1. The raw paper feeding unit 2 supports the raw paper roll 10 that has been formed by winding the raw paper strip 10a. The raw paper strip 10a is pulled out while the raw paper roll 10 rotates. More specifically, the raw paper feeding unit 2 includes feed rollers 11 and 12 and other rollers and guides. The raw paper strip 10a, which is pulled out from the raw paper roll 10 using the feed rollers 11 and 12, is transported in the direction of arrow "a" (hereinafter referred to as the "transport direction") by a transport means (not illustrated). The above transport means transports the raw paper strip 10a, after pulled out from the raw paper roll 10, from the position at which the raw paper feeding unit 2 is disposed to the position at which the winding unit 3 is disposed.

[0023] The toilet paper manufacturing machine 1 includes the perforation cutter 4. The perforation cutter 4 forms rows of perforations in the raw paper strip 10a while the raw paper strip 10a is transported by the transport means. The rows of perforations are formed so as to extend in the cross direction X of the raw paper strip 10a. The toilet paper manufacturing machine 1 also includes the marking nozzle 5 disposed at a position that the raw paper strip 10a reaches after passing the perforation cutter 4. The marking nozzle 5 is configured to form marks on the raw paper strip 10a. The toilet paper manufacturing machine 1 also includes the winding unit 3 disposed at a position that the raw paper strip 10a reaches after passing the marking nozzle 5. The winding unit 3 winds up the raw paper strip 10a. The toilet paper

manufacturing machine 1 also includes a paper cutter (not illustrated) at a position between the marking nozzle 5 and the winding unit 3 in the transport direction. The paper cutter cuts the raw paper strip 10a to form the end of the strip wound in the winding unit 3.

[0024] The winding unit 3 includes a winding shaft 30. The raw paper strip 10a transported by the transport means is wound around the winding shaft 30. The winding unit 3 also includes winding guide rollers 32 and 33 disposed under the winding shaft 30. The winding guide rollers 32 and 33 enable the raw paper strip 10a to be wound around the winding shaft 30.

[0025] The winding unit 3 further includes a pressure roller 31 disposed above the winding shaft 30. The pressure roller 31 presses the raw paper strip 10a (i.e., a roll 20) wound around the winding shaft 30 so as to exert an appropriate tension on the raw paper strip 10a. The pressure roller 31, which is supported by a supporting means, is configured to exert a predetermined pressure on the roll 20 appropriately in response to the outside diameter of the roll 20 that varies as the winding progresses.

[0026] The toilet paper manufacturing machine 1 includes a cutting means configured to cut the roll 20 that has been wound in the winding unit 3. The cutting means cuts the roll 20 crosswise at multiple positions.

[0027] Fig. 2 is a diagram illustrating the part of the toilet paper manufacturing machine 1 in which marking nozzles 5 are disposed. The marking nozzles 5 form marks 50 on the raw paper strip 10a transported from the raw paper feeding unit 2 to the winding unit 3. In Fig. 2, the raw paper strip 10a that the transport means is transporting is viewed from above. For example, the toilet paper manufacturing machine 1 includes multiple marking nozzles 5, and the marking nozzles 5 are fixed, for example, using a mounting member at a position above the raw paper strip 10a being transported by the transport means.

[0028] The multiple marking nozzles 5 are arranged in the cross direction X of the raw paper strip 10a being transported. The raw paper strip 10a is wound into the roll 20 in the winding unit 3, and the roll 20 is cut by the cutting means into toilet paper rolls 21, 22, 23, and 24. The marking nozzles 5 are spaced in the cross direction X such that the marking nozzles 5 can cause a prescribed liquid to adhere to the raw paper strip 10a at positions corresponding to widthwise opposite end portions of each of the toilet paper rolls 21, 22, 23, and 24. For example, the number of the marking nozzles 5 to be provided is twice the number of the toilet paper rolls 21, 22, 23, and 24 produced by cutting a single roll 20. Note that the number of the marking nozzles 5 included in the toilet paper manufacturing machine 1 is not limited to that illustrated in Fig. 2.

[0029] The toilet paper manufacturing machine 1 includes piping, a tank, a compressor, and a control means, which are not illustrated. The compressor supplies the prescribed liquid from the tank to the marking nozzles 5 through the piping. The control means controls the compressor and the marking nozzles 5 to adjusts the timing and the amount of the liquid discharged from the marking nozzles 5.

[0030] Next, the operation of the toilet paper manufacturing machine 1 is described. The raw paper strip 10a is produced from paper material using a paper machine and a dryer machine, and the raw paper roll 10 is produced by winding the raw paper strip 10a. Therefore the raw paper roll 10 is placed in the raw paper feeding unit 2, and the raw paper strip 10a is pulled out from the raw paper roll 10 and transported by the transport means to the winding unit 3. In the course of the transportation, the perforation cutter 4 forms rows of perforations 40 in the raw paper strip 10a, the rows extending in the cross direction X thereof. The rows of perforations 40 are formed in predetermined intervals in the transport direction. The rows of perforations 40 are formed in the cross direction X of the raw paper strip 10a so as to connect the side ends of the strip.

[0031] The toilet paper manufacturing machine 1 detects the position of each row of perforations 40 on the raw paper strip 10a in the transport direction using a sensor. When the row of perforations 40 of the raw paper strip 10a comes under the marking nozzles 5, the toilet paper manufacturing machine 1 discharges an appropriate amount of the prescribed liquid from the marking nozzles 5 onto the row of perforations 40 by controlling, for example, the compressor and the marking nozzles 5. For example, the prescribed liquid is a liquid containing an arbitrary pigment dispersed in water. The raw paper strip 10a is thereby stained with a color different from that of the raw paper strip 10a. The raw paper strip 10a stained with the prescribed liquid is transported to the winding unit 3 by the transport means.

[0032] Fig. 3 is a diagram illustrating the roll 20 produced by winding the raw paper strip 10a in the winding unit 3. The raw paper strip 10a transported to the winding unit 3 is guided by the winding guide rollers 32 and 33 and is wound around the winding shaft 30. The winding shaft 30 winds the raw paper strip 10a and thereby forms the roll 20 having the same width as that of the raw paper strip 10a.

[0033] In the winding unit 3, when the winding shaft 30 winds the raw paper strip 10a to form the roll 20, the pressure roller 31 exerts an appropriate pressure to the outer surface of the roll 20 to wind the raw paper strip 10a without generating looseness and wrinkles. The paper cutter is disposed between the marking nozzles 5 and the winding guide roller 32. The toilet paper manufacturing machine 1 uses the paper cutter to cut the raw paper strip 10a transported by the transport means when a predetermined length of the raw paper strip 10a is wound in the winding unit 3. Consequently, the toilet paper manufacturing machine 1 stops winding the roll 20.

[0034] The roll 20 is removed from the winding shaft 30 and is cut crosswise at cutting positions 60 illustrated in Fig. 3 using cross-cutters to form the toilet paper rolls 21,

22, 23, and 24. Fig. 3 illustrates an example in which the roll 20 is cut into four toilet paper rolls 21, 22, 23, and 24. However, the number of toilet paper rolls produced from a single roll 20 is not limited to four.

[0035] Fig. 4 is a perspective view illustrating the exterior of the toilet paper roll 21. The toilet paper roll 21 is made of a paper strip 21a wound into a roll. The paper strip 21a is formed by cutting the raw paper strip 10a into paper strips having a predetermined size. The toilet paper roll 21 of Fig. 4 is produced by cutting the roll 20 crosswise at the cutting positions 60 illustrated in Fig. 3. The toilet paper roll 21 includes rows of perforations 40 formed in the paper strip 21a so as to extend in the cross direction thereof and also includes marks 50 formed on the rows of perforations 40 so as to indicate the position of the row of perforations 40. The toilet paper rolls 22, 23, and 24 also have respective rows of perforations 40 and marks 50 in a manner similar to the toilet paper roll 21. Marks 50 are provided at opposite end portions or opposite near-end portions in the cross direction X of each one of the toilet paper rolls 21, 22, 23, and 24 in such a manner that marks 50 are positioned so as to interpose respective cutting positions 60 therebetween.

[0036] The following describes a manufacturing process for forming marks 50 on the raw paper strip 10a. The marking nozzles 5 discharge or drop the prescribed liquid onto the raw paper strip 10a moving below the marking nozzles 5. The marking nozzles 5 form marks 50 by applying the prescribed liquid onto the raw paper strip 10a at positions corresponding to opposite end portions or opposite near-end portions, in the cross direction X, of each of future toilet paper rolls 21, 22, 23, and 24 to be cut from the roll 20.

[0037] For example, the marking nozzles 5 discharge or drop the prescribed liquid each time onto respective predetermined regions of the raw paper strip 10a so as to form marks 50 of 5 mm to 10 mm in size in the cross direction X of each of the toilet paper rolls 21, 22, 23, and 24. Forming the marks 50 of the above size enables a user to find the position of the row of perforations 40 easily.

[0038] The prescribed liquid may be a liquid that can expand the pore space among paper fibers. The marks 50 may be formed using such a liquid at positions corresponding to opposite edge portions, in the cross direction X, of each of future toilet paper rolls 21, 22, 23, and 24, in other words, at the cutting positions 60 illustrated in Fig. 3. As a result, the paper strip can be torn at the row of perforations 40 easily. In the case of the marks 50 being formed in the edge portions of the paper strip of the toilet paper roll 21 in the cross direction X, the prescribed liquid applied to the edge portions penetrates the paper fibers during the manufacturing process. As a result, the toilet paper roll 21 has the marks 50 formed only at the opposite edge portions of the paper strip 21a and on the row of perforations 40 as illustrated in Fig. 5. The toilet paper roll 21 is easier to tear at the portion having the mark 50 than at other portions after the prescribed liquid dries. Accordingly, the paper strip 21a can be cut easily from the edge portion of the paper strip 21a along the row of perforations 40.

[0039] When the raw paper strip 10a stained with the prescribed liquid is wound into the roll 20 in the winding unit 3, the prescribed liquid may permeate into a portion in which the row of perforations 40 is not formed. In order to prevent this from occurring, the amount of the prescribed liquid discharged from the marking nozzles 5 is adjusted appropriately. After the marking nozzles 5 apply the prescribed liquid to the raw paper strip 10a, the prescribed liquid is preferably dried by employing an appropriate drying means before the raw paper strip 10a is wound in the winding unit 3.

[0040] The prescribed liquid discharged from the marking nozzles 5 preferably has properties of developing a weak adhesion strength. In the case of using the prescribed liquid that can develop a weak adhesion strength, the raw paper strip 10a to which the prescribed liquid is applied is wound into a roll in the winding unit 3 before the prescribed liquid dries out, in other words, during the time while the prescribed liquid is capable of pasting two sheets together. The adhesion strength of the prescribed liquid is set, for example, such that the paper strip 21a of the toilet paper roll 21 of Fig. 4 is not torn unintentionally when two layers of the paper strip 21a pasted together by the prescribed liquid are separated.

[0041] In the case of using the prescribed liquid capable of adhesion, the prescribed liquid is applied to the inner surface of the raw paper strip 10a, in order to generate adhesion strength that comes inside when the raw paper strip 10a is wound into the roll 20. Since the prescribed liquid is applied to the inner surface of the paper strip 21a as described above, when the paper strip 21a is pulled out from the toilet paper roll 21 of Fig. 4, the outermost layer of the paper strip 21a is adhered to the next layer of the paper strip 21a at the marks 50. Since the outermost layer of the paper strip 21a is adhered to the next layer at the marks 50, a user feels resistance at the marks 50 of the outermost paper strip 21a when the user pulls the outermost layer of the paper strip 21a. This helps the user to find the position of the row of perforations 40 using a sense other than vision.

[0042] According to the toilet paper roll of the present disclosure, the marks 50 are formed on the row of perforations 40, which enables a user to find the position of the row of perforations 40 easily and helps the user to tear a piece of the paper strip 21a easily at the row of perforations 40 from the toilet paper roll 21.

[0043] According to the toilet paper roll of the present disclosure, the marks 50 are formed using the prescribed liquid that can develop a weak adhesion strength. Accordingly, when a user pulls out the paper strip 21a from the toilet paper roll 21 and the paper strip 21a is separated from the toilet paper roll 21, the user feels resistance at the marks 50. Accordingly, the user can find the position of the row of perforations 40 easily. Moreover, in the case of the marks 50 being colored, a user with weak eyesight

can find the position of the row of perforations 40 easily.

[0044] According to the method of manufacturing the toilet paper roll according to the embodiment of the present disclosure, the marks 50 are formed by applying the prescribed liquid to the raw paper strip 10a in the course of transporting the raw paper strip 10a pulled out from the raw paper roll 10 to the winding unit 3. This can simplify the manufacturing process in the toilet paper manufacturing machine 1 to manufacture toilet paper rolls having the marks 50 for indicating the position of the row of perforations 40. Accordingly, the toilet paper rolls 21 having the marks 50 can be manufactured while suppressing the cost increase.

[Reference Signs List]

[0045]

1 toilet paper manufacturing machine
2 raw paper feeding unit
3 winding unit
4 perforation cutter
5 marking nozzle
10 raw paper roll
10a raw paper strip
11, 12 feed roller
20 roll
21, 22, 23, 24 toilet paper roll
21a paper strip
30 winding shaft
31 pressure roller
32, 33 winding guide roller
40 row of perforations
50 mark
60 cutting position
X cross direction

Claims

1. A toilet paper roll formed by winding a paper strip into a roll, the toilet paper roll comprising:

a row of perforations formed so as to extend in a cross direction of the paper strip; and
marks formed on the row of perforations and indicating a position of the row of perforations, wherein
the marks are formed at opposite end portions of the paper strip in the cross direction.

2. The toilet paper roll according to Claim 1, wherein the marks are colored.

3. The toilet paper roll according to Claim 1 or 2, wherein

the marks causes adjacent layers of the paper strip to adhere to each other, and
when the paper strip is pulled out from the toilet paper roll and the adjacent layers are separated, the adhesion strength of the marks generates resistance.

4. The toilet paper roll according to Claim 1 or 2, wherein
the marks are formed only at opposite end portions of the paper strip in the cross direction.

5. The toilet paper roll according to Claim 1 or 2, wherein
the marks are formed at opposite edge portions of the paper strip in the cross direction.

6. A method of manufacturing toilet paper rolls, the method comprising:

a first step of forming a row of perforations on a raw paper strip pulled out from a raw paper roll, the row of perforations extending in a cross direction of the raw paper strip;
a second step of applying a prescribed liquid onto the raw paper strip at a position of the row of perforations; and
a third step of obtaining toilet paper rolls by cutting a roll formed by winding the raw paper strip to which the prescribed liquid has adhered, wherein
in the second step, the prescribed liquid is applied to the raw paper strip to form marks at positions corresponding to opposite end portions in the cross direction of each one of the toilet paper rolls to be obtained by cutting the roll of the raw paper strip in the third step.

7. The method of manufacturing toilet paper rolls according to Claim 6, wherein
in the second step, multiple nozzles that are arranged so as to extend in the cross direction of the raw paper strip discharge the prescribed liquid to cause the prescribed liquid to adhere to the raw paper strip at the position of the row of perforations.

8. The method of manufacturing toilet paper rolls according to Claim 6 or 7, wherein
in the second step, the prescribed liquid having an arbitrary color is applied onto the raw paper strip.

FIG.1

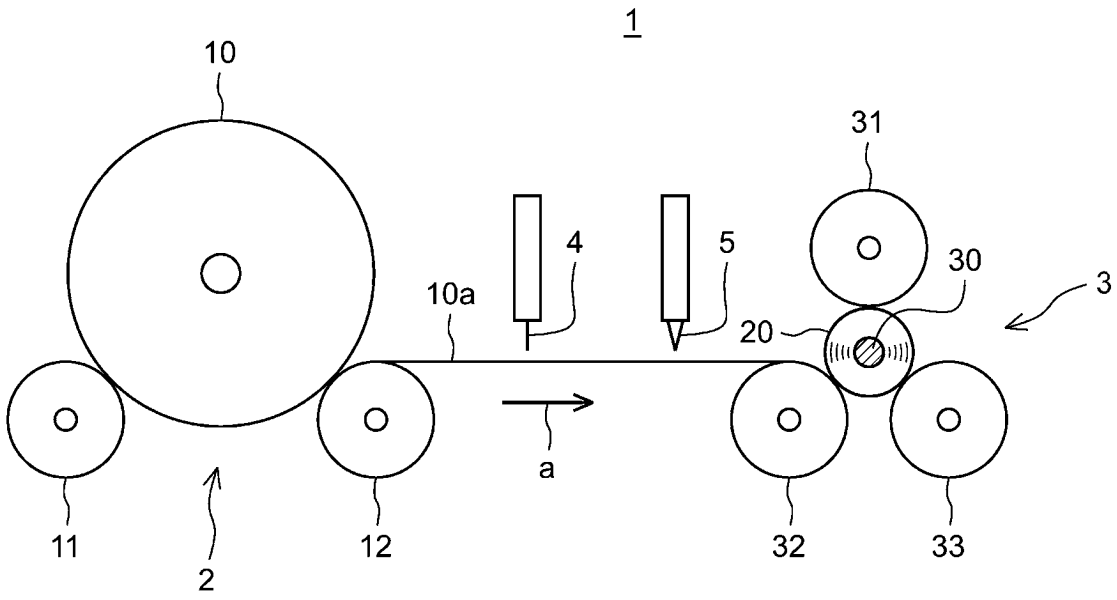

FIG.2

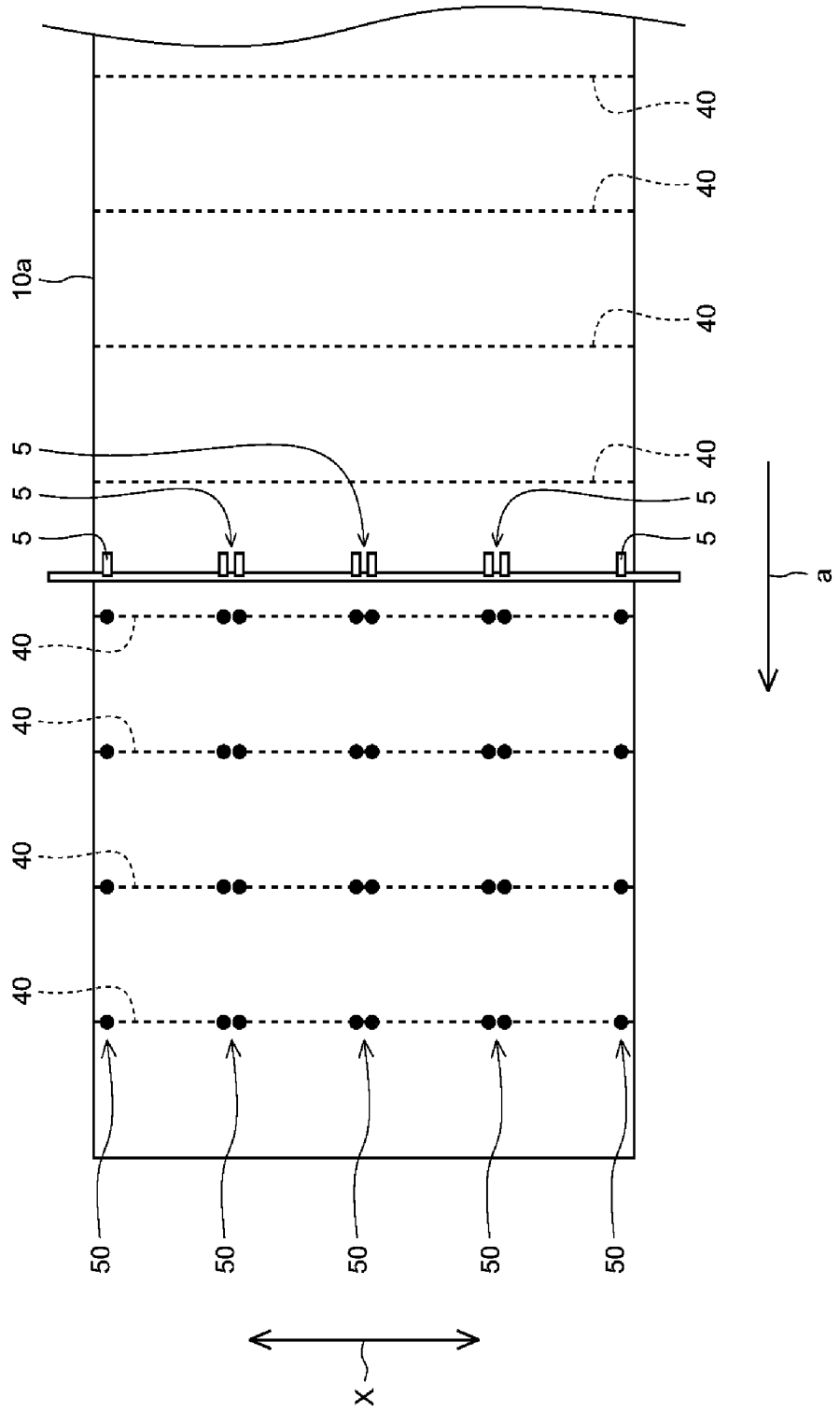

FIG.3

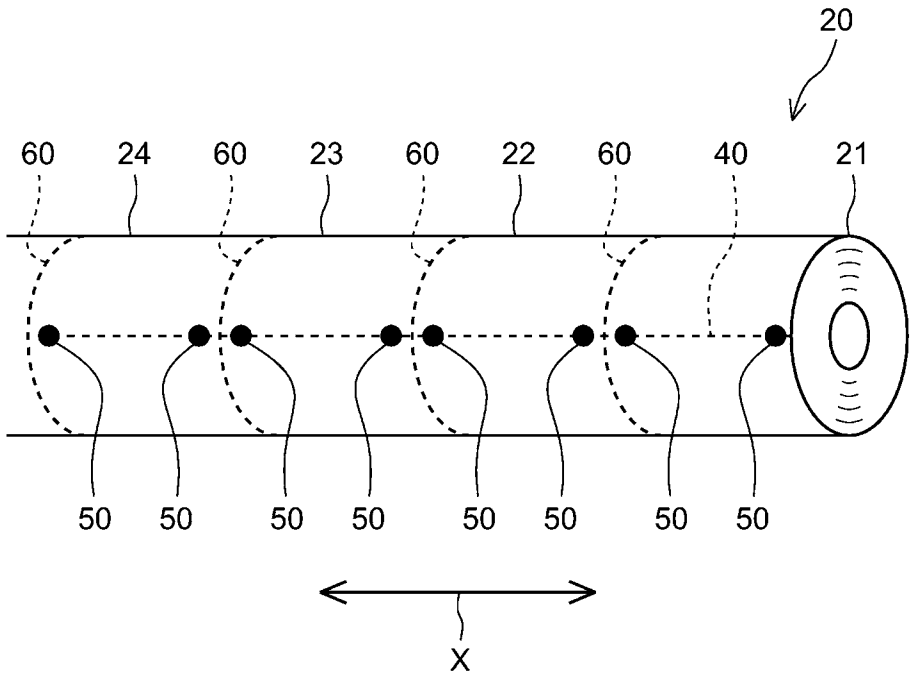
20
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FIG.4

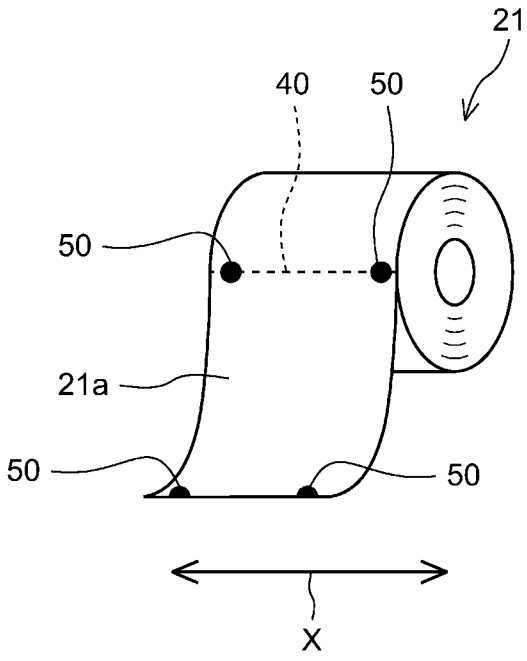
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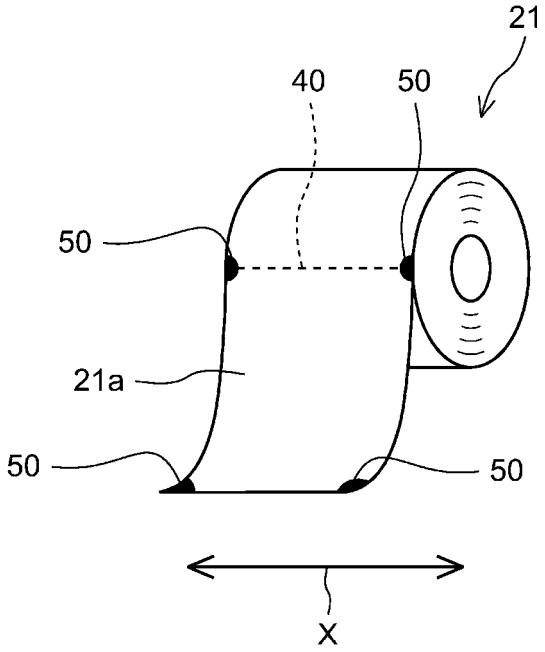
FIG.5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2023/021556

A. CLASSIFICATION OF SUBJECT MATTER

A47K 10/16(2006.01)i
FI: A47K10/16 B

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47K10/16

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

Published examined utility model applications of Japan 1922-1996
Published unexamined utility model applications of Japan 1971-2023
Registered utility model specifications of Japan 1996-2023
Published registered utility model applications of Japan 1994-2023

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 178621/1987 (Laid-open No. 81991/1989) (MAKIHARA, Yasuji) 01 June 1989 (1989-06-01), specification, page 3, line 12 to page 5, line 13, fig. 4	1-3, 5
X	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 87987/1982 (Laid-open No. 190094/1983) (UCHIDA, Hiroyasu) 17 December 1983 (1983-12-17), page 1, line 4 to page 3, line 5, fig. 2	1-5
A		6-8
X	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 070193/1981 (Laid-open No. 182400/1982) (OGAWA, Masako) 18 November 1982 (1982-11-18), page 2, lines 1-9, fig. 2	1-5
A		6-8
Y	JP 2014-068723 A (DAIO PAPER CORP.) 21 April 2014 (2014-04-21) paragraphs [0027]-[0032]	6-8
A		1-5

☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search	Date of mailing of the international search report
10 July 2023	**08 August 2023**
Name and mailing address of the ISA/JP **Japan Patent Office (ISA/JP)** **3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915** **Japan**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

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International application No.
PCT/JP2023/021556

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2008/104197 A1 (SCA HYGIENE PRODUCTS GMBH) 04 September 2008 (2008-09-04) page 15, line 15 to page 21, line 2, fig. 2	6-8
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2023/021556

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
JP 1-81991 U1	01 June 1989	(Family: none)	
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REFERENCES CITED IN THE DESCRIPTION

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