

Title: METHOD FOR MANUFACTURING THE TAB OF A CAN SO AS TO BE ABLE TO USE THE END THEREOF FOR PROMOTIONAL USE

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of Korean Patent Application No.10-2010-0071742, filed on July 26, 2010 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

Technical Field

The present invention relates to a method for manufacturing a promotional tab end of a can which has features in that various logos and designs of products are printed on an upper surface of a tab staked to a can so as to enhance a product quality, and a back surface marking is integrally performed for the sake of a sale promotional prize lottery by printing, on the bottom surface of a tab, various patterns or marks and alphabets, Korean alphabets, Chinese alphabets and specific characters or by applying a serial code or random codes.

Background Art

The applicant of the present invention has the registered Korean patent

number 0436996 (application number 10200159438). The manufacturing method disclosed in the above patent comprises a step for controlling a rotating speed of a printing roll with a color control so that a design can be printed on a targeted position of a tab coil, and a step for printing on a tab coil using a roll printer the speed of which can be adjusted by means of the color control. In the above described construction, there is a problem in that a color control serving to adjust the rotating speed of a roll printer does not control the rotating speed of the roll printer by detecting in real time a transfer pitch and a transfer speed of a tab coil in conformity with the purposes of the invention.

The applicant of the present invention also has the registered Korean patent number 100614464 (application number 1020050022048) entitled a method for manufacturing a promotional tab of a can which has features in that there is provided a sensing apparatus installed at a printing uncoiler and a printing recoiler for the purpose of detecting the changes in the outer diameters of the coils, so the changes of the outer diameters of the coils engaged at the printing uncoiler and the printing recoiler can be automatically detected in real time, and the rotating speed and the revolutions of the printing uncoiler and the printing recoiler can be integrally controlled by using the detected changes, whereby the tab coil can maintain a constant transfer pitch, transfer speed and coil tension. However, in the above described construction, it is hard to accurately detect in real time the changes in the outer diameters of the coils, so

an accurate printing is hard to achieve due to the above mentioned problems.

Reference Information on Prior Arts

[Reference 1] Registered Korean Patent number 100436996, Applicant: Lee, Do-hee

[Reference 2] Registered Korean Patent number 100614464 Applicant: Lee, Do-hee

Disclosure of Invention

Accordingly, it is an object of the present invention to provide a method for continuously performing printing and marking on an upper surface and a bottom surface of a tab coil always at an accurate position in such a way that an accurate coil transfer distance can be maintained by transferring as many as the number of pitch holes to a pitch roll by counting the number of the pitch holes of a tab coil transferred with the aid of a pitch hole sensor when driving a pitch roll in case of the printing of a tab coil, and at the same time a constant tension of a tab coil can be maintained by performing in sync a pitch roll driving and a printing uncoiler and a printing recoiler, so a printing and marking can be performed on the upper surface and the bottom surface of a coil always at an accurate position. So, the work efficiency and product quality can be enhanced, and the structure of the printing equipment can be simplified, so the cost down effects can be obtained.

In addition, it is another object of the present invention to provide a method for manufacturing a promotional tab end of a can which makes it possible to continuously perform a tab bottom surface marking along with a tab coil upper surface printing process so as to perform various sale promotions with respect to canned beverage products.

To achieve the above objects, there is provided a method for efficiently manufacturing a promotional tab end of a can which has features in that it is possible to continuously perform a printing and marking on an upper surface and a bottom surface of a coil always at an accurate position in such a way that an accurate coil transfer distance can be maintained by transferring as many as the number of pitch holes to a pitch roll by counting the number of the pitch holes of a tab coil transferred with the aid of a pitch hole sensor when driving a pitch roll in case of the printing of a tab coil, and at the same time a constant tension of a tab coil can be maintained by performing in sync a pitch roll driving and a printing uncoiler and a printing recoiler, so a printing and marking can be performed on the upper surface and the bottom surface of a coil always at an accurate position.

Advantageous effects

The present invention has advantages in that the transfer distance and tension of the tab coil can be always maintained accurately by driving coilers in

sync with the transfer of a tab coil in such a way to control the driving of a pitch roll by counting the pitch holes of a transferring tab coil. According to the method for efficiently manufacturing a promotional tab end of a can featuring in that a tab coil can be repeatedly transferred as much as an accurate transfer distance in a simply way without an application of a servo motor in term of a coil transfer, and various markings can be integrally performed for the sake of a sale promotion of a beverage product on the bottom surface of a tab coil right following the tab coil upper surface printing process.

Brief Description of Drawings

Figure 1 is a process flow chart explaining a method for manufacturing a promotional tab end of a can according to the present invention.

Figure 2 is a side view illustrating an apparatus for manufacturing a promotional tab end of a can according to the present invention.

Figure 3 is a view for explaining the concept of an operation of a pitch roll driving and coiler driving volume apparatus of an apparatus for manufacturing a promotional tab end of a can according to the present invention.

Best modes for carrying out the invention

The method for manufacturing a promotional tab end of a can according to the present invention will be described with reference to the accompanying

drawings.

Figure 1 is a process flow chart explaining a method for manufacturing a promotional tab end of a can according to the present invention.

A pitch hole is formed at the tab coil (step 1: ST1).

The tab coil is stacked on the printing uncoiler and is passed through a printing line, and the tab coil is aligned to be in a printing line by connecting to a printing recoiler (step 2: ST2).

A printing is performed on the upper surface of the coil (step 3: ST3).

The tab coil is transferred by driving the pitch roll (step 4: ST4).

The ink printed on the transferred tab coil is UV-dried (step 5: ST5).

As the pitch roll is driven, the pitch hole sensor detects the pitch hole of the tab coil which is being transferred (step 6: ST6).

As the pitch roll is driven, the encoder measures in real time the transfer speed of the tab coil which is being transferred (step 7: ST7).

An output signal is outputted by way of the pitch hole sensor (step 6), and the release time of the marking nozzle of the back surface of the coil is set depending on the measurement of the coil transfer speed of the coil of the encoder (step 7: ST7), and the marking on the back surface of the coil is performed (step 8: ST8).

The number of the pitch holes for the sake of transfers when driving the pitch roll is set in the pitch hole counter, and the pitch hole counter counts the

number of the pitch holes of the tab coil, which is being transferred, by way of the pitch hole sensor (step 9: ST9).

The number of the set pitch holes and the tab coil are transferred to the pitch hole counter, and when the counted pitch hole numbers become same, the driving of the pitch roll stops (step 10: ST10).

As the pitch roll stops, the tab coil stops as well, and an upper surface printing signal is outputted (step 11: ST11).

The driving of the pitch roll continues until the number of the pitch holes counted during the transfer of the tab coil becomes same as the targeted value set in the pitch hole counter (step 12: ST12).

As the pitch roll is driven, the tab coil is transferred, and the uncoiler driving volume apparatus moves from the bottom dead point to the top dead point (step 13: ST13).

When the uncoiler driving volume apparatus moves out of the bottom dead point, the uncoiler increases or decreases the speed depending on the changes in the output signal of the driving volume apparatus, thus unwinding the tab coil (step 14: ST14).

As the pitch roll is driven, the tab coil is transferred, and the recoiler driving volume apparatus moves down from the top dead point to the bottom dead point (step 15: ST15). Here, the steps 13 and 15 are concurrently performed in sync with the driving of the pitch roll.

When the recoiler driving volume apparatus moves out of the top dead point, the recoiler increases and decreases the speed depending on the changes in the output signal of the driving volume apparatus (step 16: ST16). Here, the steps 14 and 16 are concurrently performed in sync with the driving of the pitch roll.

As the above mentioned processes are repeatedly performed, the upper surface printing and coil back surface marking of the tab coil are completed, and the printing work-completed tab coil is inputted into the conversion press (step 17: ST17) for thereby finishing the production of the promotional tab.

Figure 2 is a side view illustrating an apparatus for manufacturing the promotional tab end of the can according to the present invention.

The tab coil unwound from a hole forming uncoiler 10 passes through a tab coil looping unit 12 after the pitch holes are formed by means of a hole forming press 11, and it is wound on a hole forming recoiler 10-1 via a washing apparatus 14 and a drier 15.

In terms of the pitch hole formation ST1, the hole forming recoiler volume apparatus 13 operates in sync with the speed of the hole forming press 11, so the tab coil can be wound with a constant tension by adjusting the driving speed of the hole forming recoiler 10-1.

The tab coil mounted at the printing uncoiler 20 is connected to the printing recoiler by way of a coil in-feeding apparatus 21, a printing apparatus

30, a UV radiation apparatus 40, a pitch roll 24 and a coil out-feeding apparatus 27, so a line alignment is performed for the purpose of beginning the printing process.

The printing is performed by the printing apparatus 30 on the upper surface of the line-aligned tab coil in conformity with the printing dots. When the operation of the printing apparatus 30 is finished, the pitch roll driving control 23 provides a driving output to the pitch roll 24 for thereby driving the pitch roll 24. As the pitch roll 24 is driven, the tab coil is transferred, and the UV radiation apparatus 40 begins to operate so as to dry the ink printed on the upper surface of the tab coil which is being transferred. At the same time, the pitch hole sensor 22 detects the pitch holes of the tab coil which is being transferred, and a tab coil undersurface marking output signal is provided to an inkjet marking apparatus input apparatus 25. At the same time, the pitch hole sensor 22 detects the pitch holes of the tab coil which is being transferred and provides a pitch hole detection signal to the pitch hole counter 23-1. The pitch hole counter 23-1 generates a signal when the previously set target value becomes same as the number of the pitch holes detected by the pitch hole sensor 22, so the pitch roll driving control 23 stops the pitch roll 24.

As the pitch roll 24 is driven, the transfer of the tab coil starts, and at this time, the printing uncoiler volume apparatus 21-1 and the printing recoiler

volume apparatus 27-1 operate in sync, and the printing uncoiler volume apparatus 21-1 unwinds the tab coil by adjusting the driving speed of the printing uncoiler 20, and the printing recoiler volume apparatus 27-1 winds the tab coil at a constant speed by adjusting the driving speed of the printing recoiler 20-1 for thereby maintaining a constant speed and tension, so the tab coil is transferred and wound.

The printing-completed tab coil is inputted into the conversion press 50, thus producing the finished promotional tab.

Figure 3 is a concept view for explaining the driving of the pitch roll and the operation of the coiler driving volume apparatus of the apparatus for manufacturing the promotional tab end of the can according to the present invention.

When the printing on the upper surface of the tab coil is finished, the pitch roll driving control starts driving the pitch roll, and at this time as the pitch roll is driven, the tab coil is transferred, and as the tab coil is transferred, in case of the uncoiler driving volume apparatus, it is moved upwards, and in case of the recoiler driving apparatus, it moves downwards. In sync with the above operations, the coiler driving volume apparatus increases or decreases the driving speed of the coiler for thereby driving the coiler. The pitch hole sensor detects the pitch hole and provides a pitch hole detection signal to the pitch hole counter, and the pitch hole counter drives the pitch roll until the number of

previously set pitch holes become same as the number of the detected pitch holes, thus transferring the tab coil, and when the number of the previously set pitch holes is same as the number of the detected pitch holes, the driving of the pitch roll is stopped by the pitch roll driving control. At this time, the printing uncoiler driving volume apparatus drives the uncoiler until the bottom dead point, thus unwinding the coil, and the printing recoiler apparatus drives the recoiler until the top dead point for thereby winding the coil. In the above described manner, the tab coil is repeatedly transferred as much as the accurate transfer distance based on a stable tension, so the upper surface of the tab coil and the undersurface of the tab coil can be concurrently performed.

Modes for carrying out the invention

Industrial Applicability

In the preferred embodiments of the present invention, the printing or marking can be continuously performed at the accurate positions on the upper surface and the undersurface of the coil wound in a roll shape made of a non-elastic material such as a metal, a non-metal, a plastic, etc. The present invention is directed to a technology which makes it possible to form and process the products for the printing contents to be printed on the accurate positions.

Texts of Sequential Lists

Claims:

1. A method for manufacturing a promotional tab end of a can so as to be able to use the end thereof for promotional use which makes it possible to integrally print various patterns on an upper surface of a tab of a can and to do various marking for the sake of a sale promotion event prize lottery on the bottom surface of a tab, comprising:

a pitch hole formation process in which a pitch hole is formed at a tab coil, and the tab coil is wound always with a constant tension by increasing or decreasing a driving speed of a hole formation recoiler by using a hole formation recoiler volume apparatus;

a tab coil printing process comprising:

a step for printing on an upper surface of the tab coil as the printing process starts;

a step for driving the pitch roll 24 using a pitch roll driving control 23 when the operation of a printing apparatus 30 is finished;

a step for drying the printed ink by driving a UV radiation unit 40 whenever the pitch roll 24 is driven;

a step for performing a marking on an undersurface of the tab coil by using an inkjet marking apparatus by detecting the pitch holes of the tab coil with the pitch hole sensor 22;

a step for providing a pitch hole detection signal to a pitch hole

counter 23-1 to the pitch hole sensor 22 by detecting the pitch holes of the tab coil;

a step for stopping the pitch roll 24 when using the pitch hole counter 23-1, the previously set target value is same as the number of the pitch holes detected by the pitch hole sensor 22;

a step for repeatedly performing the printing on the upper surface of the tab after the pitch roll 24 stops; and

a step for concurrently performing the unwinding and winding operations of the tab coil by adjusting the driving speed of the printing coiler 20, 20-1 in such a way to operate the coiler volume apparatuses 21-1 and 27-1 in sync with the pitch roll 24 in accordance with the transfer of the tab coil when the pitch roll 24 is driven; and

a process for producing a finished promotional tab as the printing-finished tab coil is inputted into a conversion press 50.

2. The method of claim 1, wherein in the tab coil upper surface printing apparatus of the tab coil printing process, a tab coil upper surface printing apparatus performs a pad printing method, a silk screen method and a contact type printing method such as a roll printing.

3. The method of claim 1, wherein in the tab coil upper surface printing

apparatus of the tab coil printing process, the tab coil upper surface printing apparatus uses a non-contact type marking method such as an inkjet marking or a laser.

4. The method of claim 1, wherein in the tab coil bottom surface printing apparatus of the tab coil printing process, the tab coil undersurface printing apparatus uses a non-contact type marking method such as an inkjet marking or a laser.

5. The method of claim 1, wherein the pitch hole formed in the pitch hole formation process is integrally applied to the printing process and the conversion press process.