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(54) **DEVICE AND PROCESS FOR IMPRINTING DRAFT BEER BARREL**

(57) Disclosed is a device for imprinting a draft beer barrel, comprising a workbench (1) and a hydraulic pushing apparatus (2), an apparatus for imprinting the outside of a beer barrel (3) and an apparatus for imprinting the inside of a beer barrel (4) mounted on the workbench (1). The apparatus for imprinting the inside of a beer barrel (4) contains a rotating disc seat (41) rotating using a Z-axis as an axis, wherein the rotating disc seat (41) can mount a beer barrel (5), and an inner matrix (61) imprinting an inside face of the beer barrel (5) is mounted on the peripheral face of the rotating disc seat (41). The apparatus for imprinting the outside of a beer barrel (3) contains a connecting frame (31) moving linearly along a Y-axis direction, an outer matrix (62) imprinting an outside face of the beer barrel (5) being provided on the connecting frame (31). The hydraulic pushing apparatus (2) controls the outer matrix (62) on the connecting frame (31) moving linearly along an X-axis direction to make the outer matrix (62) and the inner matrix (61) fit with the wall of the beer barrel (5) for stamping. Further disclosed is a process for imprinting a draft beer barrel. The device and the process solve the problem in conventional technology of a semi-finished product being rejected due to imprinted material failing when stretched or welded, thereby reducing manufacturing costs and time for a beer barrel.

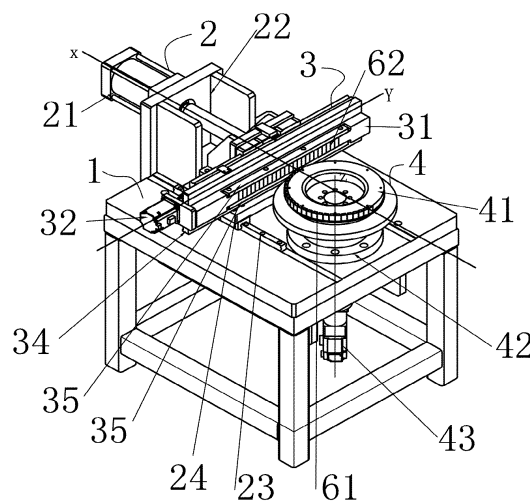


FIG. 1

Description

TECHNICAL FIELD

[0001] The present invention relates to an imprinting technical field, and in particular, to a device for imprinting a draft beer barrel and process thereof.

BACKGROUND

[0002] Beer barrels are commonly used containers of beer. In order to guarantee the strength of the beer barrel and reduce the weigh and derust, beer barrels are usually made of stainless steel, etc.. For easy identification, usually related identification information is printed on the body of the beer barrel. In traditional process, usually the identification information is printed on the raw materials (such as stainless steel plate) by the printing matrix, and then raw materials printed with identification information are stretched and welded to a barrel body, but the production process has the following drawbacks:

1. When operation errors appear during stretching and welding or semi-finished product is scrapped due to other reasons, the previous printing process is correspondingly useless, thus, it increases additional processing costs and time.
2. During the production process, some characters are the same and some are different in many logos, but all characters are used to make matrix as whole. Since the character font is not exactly the same, a plurality of printing matrixes should be made, which will increase the cost and time for producing the printing matrixes for enterprises.

SUMMARY

Technical problem

[0003] This invention is to provide a device and process for imprinting characters when a beer barrel is stretched and welded, to resolve the problems of useless imprinting process when the stretching or welding fails and semi-finished products are scrapped on the imprinting materials in prior arts.

Technical solution

[0004] To solve the above technical problem, the invention adopts the following technical solution.

[0005] A device for imprinting a draft beer barrel, comprises a workbench, a hydraulic pushing apparatus mounted on the workbench, an apparatus for imprinting the outside of a beer barrel mounted on the workbench; and an apparatus for imprinting the inside of the beer barrel mounted on the workbench. The apparatus for imprinting the inside of the beer barrel comprises a rotating disc seat rotating along a Z-axis. The rotating disc seat

is mounted on a beer barrel, and an inner matrix imprinting an inside face of the beer barrel is mounted on the circumferential face of the rotating disc seat. The apparatus for imprinting the outside of a beer barrel comprises a connecting frame moving linearly along a Y-axis direction, an outer matrix imprinting an outside face of the beer barrel being provided on the connecting frame. The hydraulic pushing apparatus controls the outer matrix on the connecting frame to move linearly along an X-axis direction to make the outer matrix and the inner matrix fit with the wall of the beer barrel for stamping.

[0006] In the above device for imprinting a draft beer barrel, the hydraulic pushing apparatus comprises a hydraulic cylinder, a hydraulic cylinder mounting rack, a first guide rail and a mobile frame; the hydraulic cylinder is mounted on the workbench through a hydraulic cylinder mounting rack, the first guide rail is paved on the surface of the workbench, the mobile frame is mounted on the first guide rail, moving linearly along a X-axis direction through a push rod of the hydraulic cylinder.

[0007] In the above device for imprinting a draft beer barrel, the apparatus for imprinting the outside of a beer barrel further comprises a Y-axis servomotor, a screw and a second guide rail; the Y-axis servomotor, the screw and the second guide rail are mounted on the mobile frame, and the Y-axis servomotor drives the screw to rotate, one end of the connecting frame is slidably mounted on the second guide rail along the Y axis, and the other end is spirally connected with the screw.

[0008] In the above device for imprinting a draft beer barrel, the apparatus for imprinting the inside of a beer barrel further comprises a Z-axis servomotor and a bearing; the bearing is mounted on the workbench, the rotating disc seat is mounted inside the bearing, and the Z-axis servomotor is arranged at the bottom of the workbench, to drive the rotating disc seat to rotate on the bearing using Z-axis as the axis line.

[0009] In the above device for imprinting a draft beer barrel, both the inner matrix and the outer matrix comprise at least one matrix, a single matrix of the inner matrix matches with a single matrix of the outer matrix to form a pair of matrix components imprinting single character; the matrix is mounted on the Y-axis plane of the connecting frame and the circumferential surface of the rotating disc seat respectively, when the matrix of the connecting frame is stamping to the matrix of the rotating disc seat along the X-axis direction, the stamping of a single matrix is completed.

[0010] In the above device for imprinting a draft beer barrel, the circumferential surface of the rotating disc seat and the Y-axis plane of the connecting frame are provided with at least one dovetail grooves of the same size (44,36), each matrix has the same size, the back of the matrix is snapped fit inside the dovetail groove to make the matrix to mount on the Y-axis plane of the connecting frame and the circumferential surface of the rotating disc seat respectively.

[0011] In the above device for imprinting a draft beer

barrel, when the X-axis and the diameter of the rotating disc seat are in a straight line, the matrix of the connecting frame and the rotating disc seat on the straight line can be stamped normally. A process for imprinting a draft beer barrel, comprises the following steps:

1) mounting and aligning a plurality of matrix components of single character corresponding to a logo on the Y-axis plane of a connecting frame and a circumferential surface of a rotating disc seat respectively;

2) setting a welded and stretched beer barrel to the rotating disc seat, to make the inside of the beer barrel correspond to the matrix of the convex matrix structure in the matrix component, and the outside of the beer barrel correspond to the matrix of the concave matrix structure in the matrix component, wherein the matrix of the first concave matrix structure and the matrix of the first convex matrix structure are at the stamping position;

3) moving along the x-axis through the connecting frame to make the matrix of the first concave matrix structure in contact with the side wall of the beer barrel and fit with the matrix of the first convex matrix structure to stamp the first character of logo on the side wall of the beer barrel, and then the connecting frame moves along the direction opposite to the X-axis to make the matrix of the first convex matrix structure to stamp to separate from the matrix of the first concave matrix structure;

4) after separation, moving the connecting frames along the Y axis to make the matrix of the next concave matrix structure to move to the stamping position, and the rotating disc seat rotates along Y-axis to make the beer barrel and the matrix of the next convex matrix structure to rotate to the stamping position, and then stamping according to the way in step 3;

5) stamping the remaining characters according to the way in step 4, to complete the stamping of the logo.

[0012] If the characters and sequences of the matrix components are identical with the previous ones in step 1, reserve the same matrix components and replace the matrix components with different characters and sequences.

Technical advantages

[0013] The device and process for imprinting a draft beer barrel in the invention have the following advantages:

(1) By equipping with the inner matrix and outer matrix of the corresponding logos on the rotating disk and connecting frame, the beer barrel after stretched and welded can be placed on the rotating disc seat

of the equipment, and through the matching and pressing of the outer matrix and the inner matrix, the logo can be stamped on the side wall of the beer barrel, to achieve the operation of stretching and welding before the imprinting process, thus, avoiding the uselessness of previous imprinting process caused by scrapping of the stretched and welded semi-finished products and saving the process, therefore, it can reduce the production cost and time. (2) The matrix of single inner matrix and the matrix of single outer matrix match to form a pair of matrix components of imprinting single characters, moreover the matrix is mounted on the connecting frame and rotating disc seat respectively, thereby the printing matrix with the identity is dismantled into a plurality of matrix components of single character. In the production process, some of characters are the same and some are different in the logo, so, it is only required to replace the matrix component different from previous one and adjust the sequence when replacing matrix, and those matrix component of the same characters can be retained, so achieve the versatility and interchangeability of matrix components among different logos, which can not only save the time to replace matrixes, but also it is not required to produce a variety of different printing matrixes, and it is only required to produce the matrix components of different character font, saving the matrix production costs and time.

(3) The positioning of matrix is more precise when moving and rotating through the principle of servomotor.

(4) When the connecting frame moves along X-axis to separate the matrix of the concave matrix structure from the matrix of the convex matrix structure, the side wall of the beer barrel is still stamped on and clamped with the matrix of the convex matrix structure, to allow the rotating disc seat to drive the beer barrel to rotate around Z-axis. Different sizes of beer barrels can be mounted on the rotating disk, and it does not need to a variety of customized rotating disks, reducing the cost for the production of a device for imprinting a draft beer barrel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

FIG. 1 shows a perspective view of a device for imprinting a draft beer barrel in the invention;
FIG. 2 shows a bird's-eye view of a device for imprinting a draft beer barrel in the invention;
FIG. 3 shows a perspective view of a beer barrel placed in a device for imprinting a draft beer barrel in the invention;
FIG. 4 shows a front view of a beer barrel placed in a device for imprinting a draft beer barrel in the invention;

FIG. 5 shows an enlarged view of A in FIG. 2;
FIG. 6 shows an enlarged view of B in FIG. 2; and
FIG. 7 shows a process flow diagram of imprinting
the draft beer barrel in the invention.

in the drawings, 1: workbench, 2: hydraulic
pushing apparatus, 3: apparatus for imprinting
the outside of a beer barrel, 4: apparatus for im-
printing the inside of a beer barrel, 5: beer barrel,
21: hydraulic cylinder, 22: hydraulic cylinder
mounting rack, 23: first guide rail, 24: mobile
frame, 31: connecting frame, 32: Y-axis servo-
motor, 33: screw, 34: second guide rail, 35: fixing
plate, 36: dovetail groove, 41: rotating disc seat,
42: servomotor, 43: bearing, 44: dovetail
groove, 61: inner matrix, 62: outer matrix, 63:
matrix.

DETAILED DESCRIPTION

[0015] The invention is further described in details in
combination with drawings and embodiments. The fol-
lowing embodiments are used to describe the invention
rather than limit the scope of the invention.

[0016] Embodiment 1: Referring to FIG. 1-FIG. 4, a
device for imprinting a draft beer barrel, including a work-
bench 1 and a hydraulic pushing apparatus 2, an appa-
ratus for imprinting the outside of a beer barrel 3 and an
apparatus for imprinting the inside of a beer barrel 4
mounted on the workbench 1; the hydraulic pushing ap-
paratus 2 includes a hydraulic cylinder 21, a hydraulic
cylinder mounting rack 22, a first guide rail 23 and a mo-
bile frame 24; the hydraulic cylinder 21 is mounted on
the workbench 1 through a hydraulic cylinder mounting
rack 22, the first guide rail 23 is paved on the surface of
the workbench 1, the mobile frame (24) is mounted on
the first guide rail 23. The apparatus for imprinting the
outside of a beer barrel 3 further includes a connecting
frame 31, a Y-axis servomotor 32, a screw 33 and a sec-
ond guide rail 34; the Y-axis servomotor 32, the screw
33 and the second guide rail 34 are mounted on the mo-
bile frame 24, and the Y-axis servomotor 32 drives the
screw 33 to rotate, one end of the connecting frame 31
is slidably mounted on the second guide rail along the Y
axis, and the other end is spirally connected with the
screw. The connecting frame 31 is provided with an outer
matrix 62 of the concave matrix structure, to make the
outer matrix 62 to move along the Y-axis axially. The
apparatus for imprinting the inside of a beer barrel 4 in-
cludes a rotating disc seat 41, a Z-axis servomotor 42
and a bearing 43; the bearing 43 is mounted on the work-
bench 1, the circumferential surface of the rotating disc
seat 41 is mounted inner matrix 61 of the convex matrix
structure. The rotating disc seat 41 is mounted inside the
bearing 43, and the servomotor 42 is arranged at the
bottom of the workbench 1, to drive the inner matrix 61
to rotate on the bearing 43 using Z-axis as the axis line.
The rotating disc seat 41 can socket the beer barrel 5,

the outer matrix 62 moves linearly along X-axis direction
through the hydraulic cylinder 21 and matches oppositely
with the inner matrix 61 (in the same horizontal line). The
outer matrix 62 is arranged at outside of the beer barrel
5 and the inner matrix 61 is arranged at the inside of the
beer barrel 5. When the outer matrix 62 moves linearly
along a X-axis direction through the push rod of hydraulic
cylinder 21, the outer matrix 62 on the connecting frame
31 moves linearly along a straight line to make inner ma-
trix 61 and the outer matrix 62 to stamp on the side wall
of the beer barrel 5.

[0017] A complete logo can be stamped through this
device, to achieve the operation of "stretching and weld-
ing before imprinting", thus, it avoids the uselessness of
previous imprinting process caused by scrappage of the
stretched and welded semi-finished products and saves
the process, and therefore, it can reduce the production
cost and time. Moreover, through the servomotor control,
the outer matrix 62 and inner matrix 61 can move more
accurately.

[0018] Embodiment 2: Referring to FIG. 3-FIG. 6, both
the inner matrix 61 and the outer matrix 62 include at
least one matrix 63, a single matrix 63 of the inner matrix
61 matches with a single matrix 63 of the outer matrix 62
to form a pair of matrix components imprinting single
character; the circumferential surface of the rotating disc
seat 41 and the Y-axis plane of the connecting frame 31
are provided with at least one dovetail grooves of the
same size 44,36, each matrix 63 has the same size, the
back of the matrix 63 is snapped fit inside the dovetail
groove 44 to make the matrix 63 to mount on the Y-axis
plane of the connecting frame 31 and the circumferential
surface of the rotating disc seat 41 respectively. Sup-
posed that we want to print the logo "ABCD", the tradi-
tional design of the inner matrix 61 and outer matrix 62
of printing matrix is to Siamese matrix 63 engraved with
"ABCD" on a whole inner matrix 61 and outer matrix 62;
and the printing matrix should replace the original printing
matrix "EFCD", and since the logo is different, it is re-
quired to produce again; while in the invention, the logos
"ABCD" and "EFCD" are respectively divided into matrix
components of four single characters: "a", "B", "C", "D"
and "E", "F", "C", "D", and when it is required to replace
the original matrix components "E", "F", "C" and "D"
mounted on the device in the invention, only "A" and "B"
are replaced by "E" and "F" (mounted within the corre-
sponding dovetail groove 44,36), and the remaining "C"
and "D" are reserved; the "C" and "D" matrix components
can be shared and interchanged. Of course, when the
logo "ACBD" is used to replace the original "EFCD", on
the basis of the above operation, change the sequence
of "A", "B", "C", "D" to "A", "C", "B", "D" (i.e, matrix "A",
"C", "B" is mounted to the dovetail groove 44, 36 at
corresponding sequence). Thus, it achieves the versatil-
ity and interchangeability of matrixes, which can not only
save the time to replace matrixes, but also it is not re-
quired to produce a variety of different printing matrixes,
saving the matrix production costs and time. In addition,

when the matrix 63 of connecting frame 31 stamps to the direction of matrix of rotating disc seat, it can complete the stamping of a single matrix component. When the X-axis and the diameter of the rotating disc seat are in a straight line, the matrix 63 of the connecting frame 31 and the rotating disc seat 41 on the straight line can be stamped normally. This structure can achieve single stamping of characters in the logo.

[0019] Referring to FIG. 1 and FIG. 7, a process for imprinting a draft beer barrel includes the following steps:

1) mount and align a plurality of matrix components of single character corresponding to the logo on the Y-axis plane of the connecting frame and the circumferential surface of the rotating disc seat respectively; in the step 1, if the characters or sequence of the matrix component used are consistent with the previous ones, the previous ones can be reserved. This process has the same advantages as embodiment 2 and it achieves the matrix versatility and interchangeability, which can not only save the time to replace matrixes, but also it is not required to produce a variety of different printing matrixes, saving the matrix production costs and time.

2) Set the welded and stretched beer barrel to the rotating disc seat 41, to make the inside of the beer barrel correspond to the matrix 63 of the convex matrix structure in the matrix component, and the outside of the beer barrel correspond to the matrix 63 of the concave matrix structure in the matrix component. The connecting frame can moves the rotating disc seat 41 along the x-axis; in addition, the designer designs a normal stamping position between the matrix 63 of a concave matrix structure and the matrix 63 of a concave matrix structure in a single matrix component, at this time, the matrix 63 of the first concave matrix structure and the matrix 63 of the first convex matrix structure are at the stamping position (stamping position: when the X-axis and the diameter of the rotating disc seat are in a straight line, the matrix 63 of the connecting frame 31 and the rotating disc seat 41 on the straight line can be stamped normally, thus, the position of this straight line is the stamping position).

3) Move along the x-axis through the connecting frame 31 to make the matrix 63 of the first concave matrix structure in contact with the side wall of the beer barrel and fit with the matrix 63 of the first convex matrix structure to stamp the first character of logo on the side wall of the beer barrel, and then the connecting frame 31 moves along the direction opposite to the X-axis to make the matrix 63 of the first convex matrix structure to stamp to separate from the matrix 63 of the first concave matrix structure.

4) After separation, the connecting frame 31 moves along the Y axis to make the matrix of the next concave matrix structure to move to the stamping position. Since the side wall of the beer barrel is clamped

inside the first matrix component after stamping, when the matrix of a concave matrix structure is separated from the side wall of the beer barrel, the side wall of the beer barrel is still stamped and clamped on the matrix of the convex matrix structure, to make the rotating disc seat to drive the beer barrel to rotate along Z-axis. The rotating disc seat 41 rotates along Y-axis to make the beer barrel 5 and the matrix of the next convex matrix structure to rotate to the stamping position, thus, the rotating disk can mount the beer barrel of different sizes, requiring no customized rotating disk of different sizes and further reducing the cost for the production of a device for imprinting a draft beer barrel, and then stamp according to the way in step 3;

5) Stamp the remaining characters according to the way in step 4, to complete the stamping of the logo.

[0020] This operation process can save the steps and enhance the interchangeability of matrixes, thus, it can reduce the production cost and time of matrixes, easy to operate. The above are only preferred embodiments of the present invention. It should be noted that, those ordinary technicians skilled in the art can make improvements and modifications without departing from the principles of the present invention, and these improvements and modifications should fall the scope of protection of the invention.

Claims

1. A device for imprinting a draft beer barrel, comprising:

a workbench (1);
a hydraulic pushing apparatus (2) mounted on the workbench (1);
an apparatus for imprinting the outside of a beer barrel (3) mounted on the workbench (1); and
an apparatus for imprinting the inside of the beer barrel (4) mounted on the workbench (1);

wherein the apparatus for imprinting the inside of the beer barrel (4) comprises a rotating disc seat (41) rotating along a Z-axis, wherein the rotating disc seat (41) is mounted on a beer barrel (5), and an inner matrix (61) imprinting an inside face of the beer barrel (5) is mounted on the circumferential face of the rotating disc seat (41), the apparatus for imprinting the outside of a beer barrel (3) comprises a connecting frame (31) moving linearly along a Y-axis direction, an outer matrix (62) imprinting an outside face of the beer barrel (5) being provided on the connecting frame (31), the hydraulic pushing apparatus (2) controls the outer matrix (62) on the connecting frame (31) to move linearly along an X-axis direction to make the outer matrix (62) and the inner matrix (61)

fit with the wall of the beer barrel (5) for stamping.

2. The device for imprinting a draft beer barrel according to claim 1, wherein the hydraulic pushing apparatus comprises a hydraulic cylinder (21), a hydraulic cylinder mounting rack (22), a first guide rail (23) and a mobile frame (24); the hydraulic cylinder (21) is mounted on the workbench (1) through a hydraulic cylinder mounting rack (22), the first guide rail (23) is paved on the surface of the workbench (1), the mobile frame (24) is mounted on the first guide rail (23), moving linearly along a X-axis direction through a push rod of the hydraulic cylinder (21). 10
3. The device for imprinting a draft beer barrel according to claim 2, wherein the apparatus for imprinting the outside of a beer barrel further comprises a Y-axis servomotor (32), a screw (33) and a second guide rail (34); the Y-axis servomotor (32), the screw (33) and the second guide rail (34) are mounted on the mobile frame (24), and the Y-axis servomotor (32) drives the screw (33) to rotate, one end of the connecting frame (31) is slidably mounted on the second guide rail along the Y axis, and the other end is spirally connected with the screw. 15 20 25
4. The device for imprinting a draft beer barrel according to claim 3, wherein the apparatus for imprinting the inside of a beer barrel further comprises a Z-axis servomotor (42) and a bearing (43); the bearing is mounted on the workbench (1), the rotating disc seat (41) is mounted inside the bearing (43), and the Z-axis servomotor (42) is arranged at the bottom of the workbench (1), to drive the rotating disc seat (41) to rotate on the bearing (43) using Z-axis as the axis line. 30 35
5. The device for imprinting a draft beer barrel according to claim 1 or 4, wherein both the inner matrix (61) and the outer matrix (62) comprise at least one matrix (63), a single matrix (63) of the inner matrix (61) matches with a single matrix (63) of the outer matrix (62) to form a pair of matrix components imprinting single character; the matrix (63) is mounted on the Y-axis plane of the connecting frame (31) and the circumferential surface of the rotating disc seat (41) respectively, when the matrix (63) of the connecting frame (31) is stamping to the matrix (63) of the rotating disc seat (41) along the X-axis direction, the stamping of a single matrix is completed. 40 45 50
6. The device for imprinting a draft beer barrel according to claim 5, wherein the circumferential surface of the rotating disc seat (41) and the Y-axis plane of the connecting frame (31) are provided with at least one dovetail grooves of the same size (44,36), each matrix (63) has the same size, the back of the matrix (63) is snapped fit inside the dovetail groove (44) to

make the matrix (63) to mount on the Y-axis plane of the connecting frame (31) and the circumferential surface of the rotating disc seat (41) respectively.

7. The device for imprinting a draft beer barrel according to claim 5, wherein when the X-axis and the diameter of the rotating disc seat (41) are in a straight line, the matrix (63) of the connecting frame (31) and the rotating disc seat (41) on the straight line can be stamped normally. 5 10
8. A process for imprinting a draft beer barrel, comprising the following steps: 15
 - 1) mounting and aligning a plurality of matrix components of single character corresponding to a logo on the Y-axis plane of a connecting frame and a circumferential surface of a rotating disc seat respectively;
 - 2) setting a welded and stretched beer barrel to the rotating disc seat, to make the inside of the beer barrel correspond to the matrix of the convex matrix structure in the matrix component, and the outside of the beer barrel correspond to the matrix of the concave matrix structure in the matrix component, wherein the matrix of the first concave matrix structure and the matrix of the first convex matrix structure are at the stamping position;
 - 3) moving along the x-axis through the connecting frame to make the matrix of the first concave matrix structure in contact with the side wall of the beer barrel and fit with the matrix of the first convex matrix structure to stamp the first character of logo on the side wall of the beer barrel, and then the connecting frame moves along the direction opposite to the X-axis to make the matrix of the first convex matrix structure to stamp to separate from the matrix of the first concave matrix structure;
 - 4) after separation, moving the connecting frames along the Y axis to make the matrix of the next concave matrix structure to move to the stamping position, and the rotating disc seat rotates along Y-axis to make the beer barrel and the matrix of the next convex matrix structure to rotate to the stamping position, and then stamping according to the way in step 3;
 - 5) stamping the remaining characters according to the way in step 4, to complete the stamping of the logo.
9. The process for imprinting a draft beer barrel according to claim 8, wherein, if the characters and sequences of the matrix components are identical with the previous ones in step 1, reserve the same matrix components and replace the matrix components with different characters and sequences. 55

10. The process for imprinting a draft beer barrel according to claim 8, wherein, when the connecting frame moves along X-axis to separate the matrix of the concave matrix structure from the matrix of the convex matrix structure, the side wall of the beer barrel is still stamped on and clamped with the matrix of the convex matrix structure, to allow the rotating disc seat to drive the beer barrel to rotate along Z-axis.

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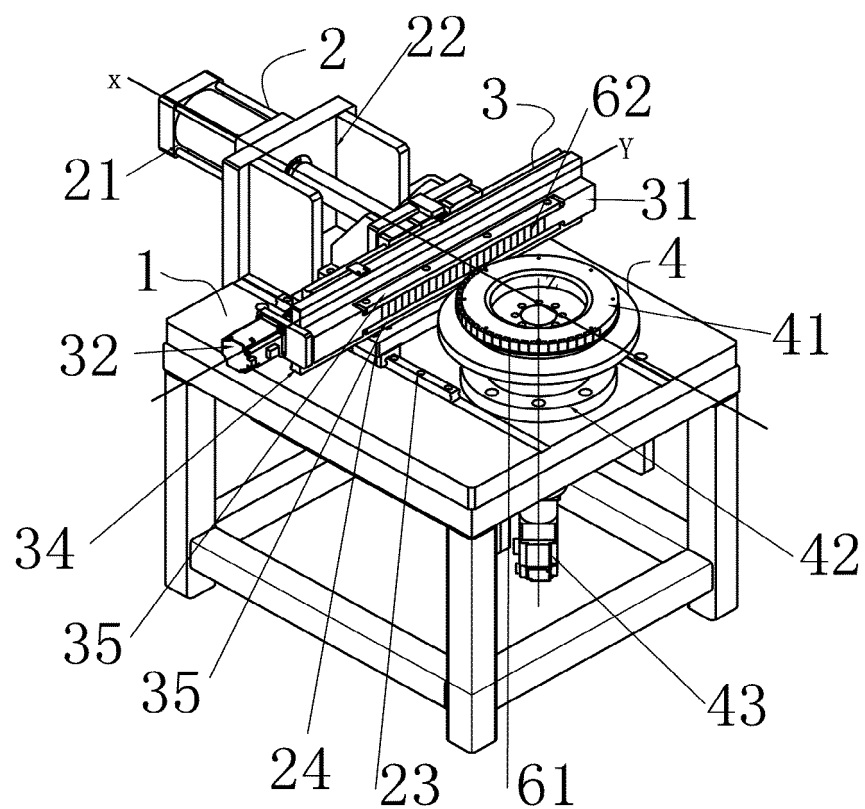


FIG. 1

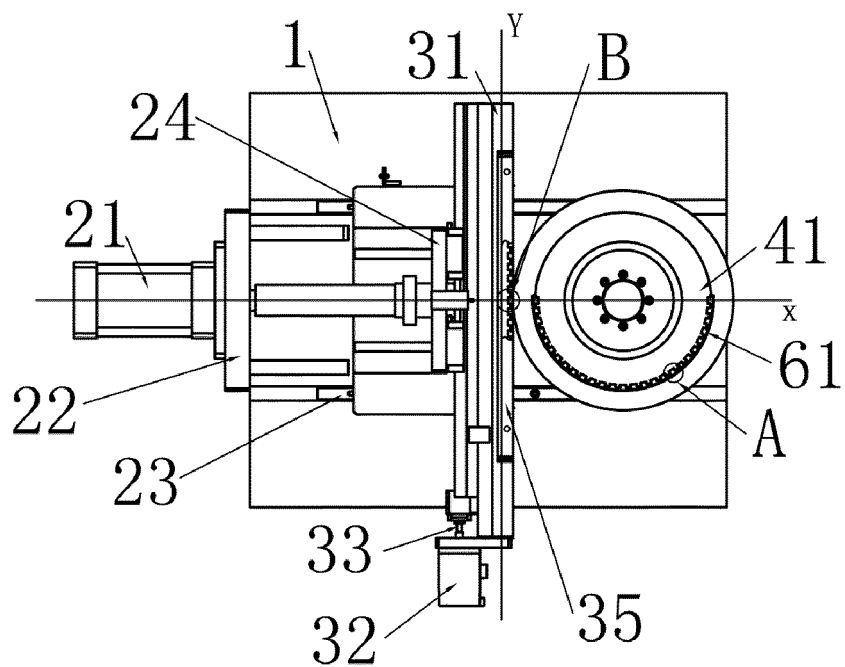


FIG. 2

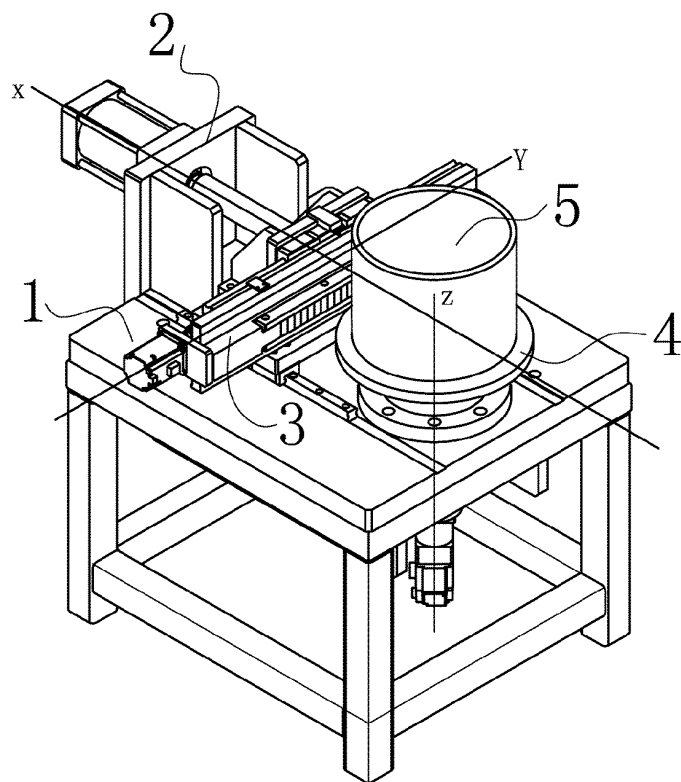


FIG. 3

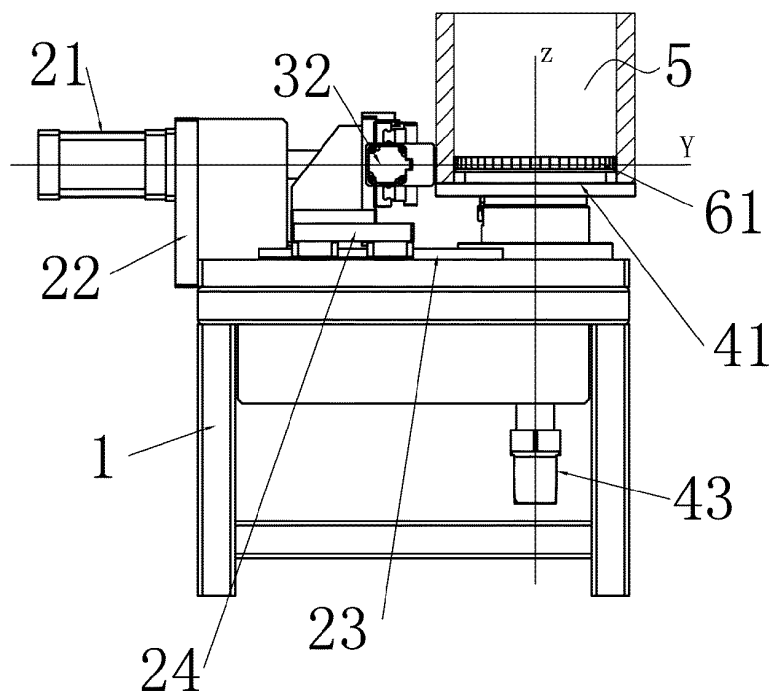


FIG. 4

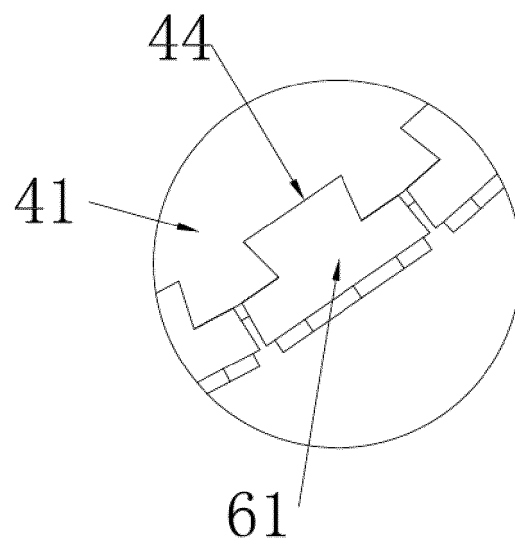


FIG. 5

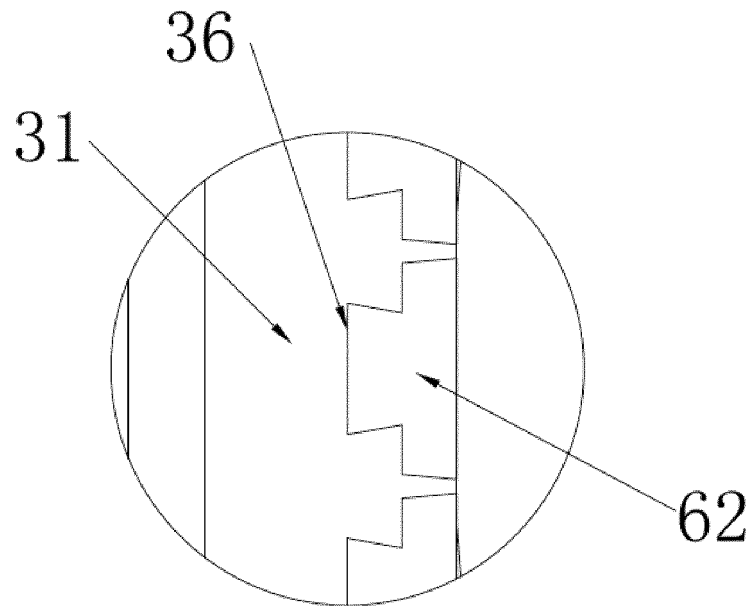


FIG. 6

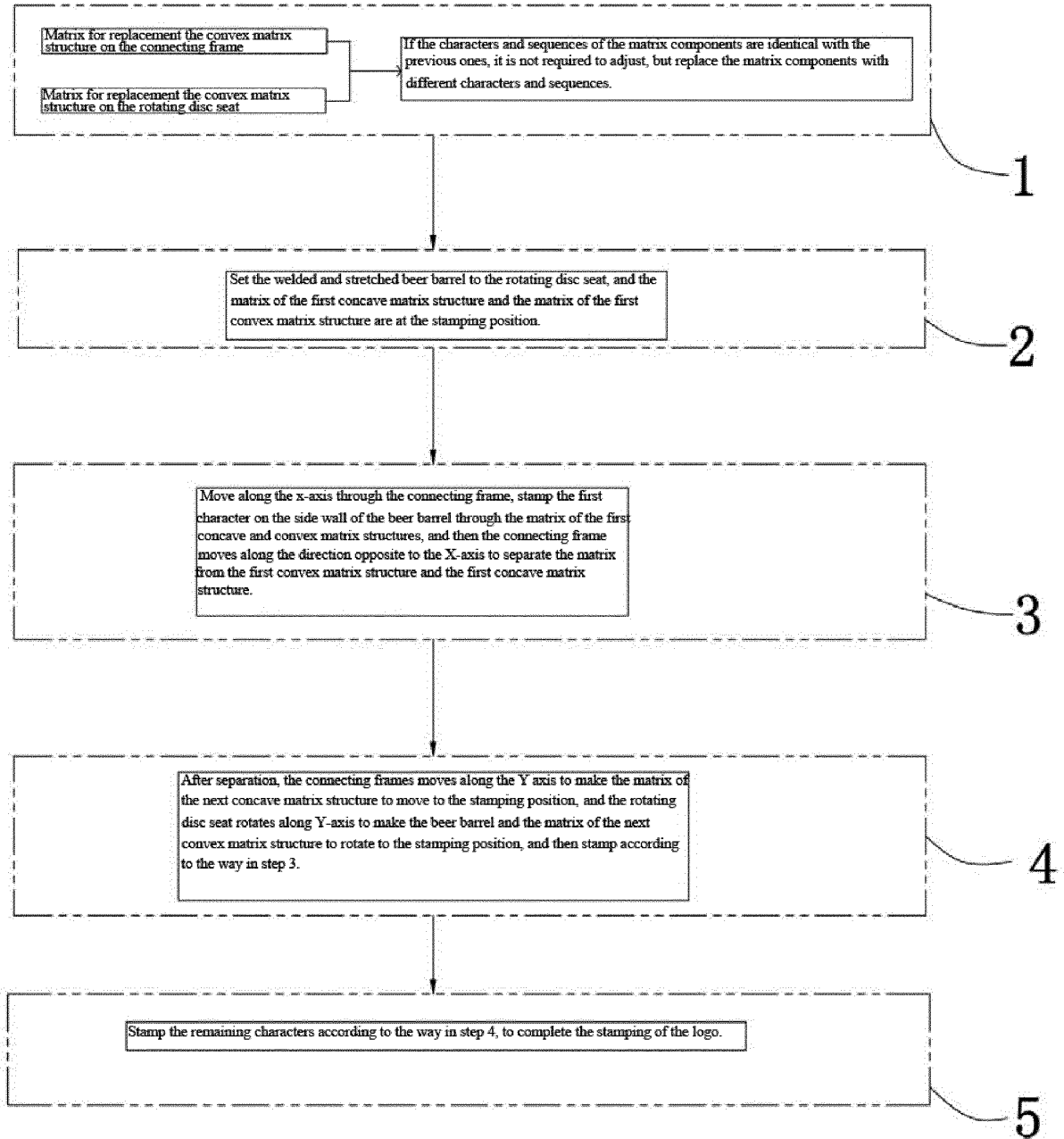


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2014/077688

A. CLASSIFICATION OF SUBJECT MATTER

B41K 3/00 (2006.01) i; B41F 17/08 (2006.01) i; B41F 17/14 (2006.01) i
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)

B41F 17/-; B41K 3/-; B65B 61/-

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)
CNABS, DWPI, SIPOABS, JPABS, CNKI: MINGJIANG, Cylinder, mode, rotary table, stamp+, print+, inner, outer, hydraulic, rotary

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 101734028 B (ZHEJIANG WINNER FIRE FIGHTING EQUIPMENT CO., LTD.), 27 July 2011 (27.07.2011), description, paragraphs [0025]-[0055], and figures 1-5	1-10
A	CN 201333839 Y (ZHEJIANG MOTORBACS AUTOPARTS CO., LTD.), 28 October 2009 (28.10.2009), the whole document	1-10
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Information on patent family members

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JP 2004-209795 A	29 July 2004	None	

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