

Description

The present invention relates to a centering stand for positioning a work piece, specially for rotary skiving and roller burnishing operations in a hollow cylinder.

Rotary skiving tools are used to accurately cut small quantities of material from the wall of a cylindrical hole. After the skiving tool has made a pass through the work piece, it is usually drawn back through the newly worked hole. Skiving tools are often used in combination with a roller burnishing tool so that the skiving tool first cuts or shaves off a small amount of material from the hole and then the roller burnishing tool, mounted coaxially on the same drive shaft with the skiving tool, burnishes the hole to a smooth finish.

If the diameter of the interior of a cylinder is very close to its nominal diameter, the roller burnishing operation will typically proceed quite smoothly. However, if the diameter of the cut cylinder is slightly oversized, the interior surface of the cylinder may not be sufficiently burnished. If the diameter is somewhat smaller than nominal, caused by cutting tool wear or other variables, the effective fixed diameter of the rollers will cause excessive working of the interior surface of the cylinder, requiring large forces to drive the tool through the cylinder, and often resulting in jamming of the tool inside the cylinder. Additionally, an out-of-tolerance hole or an out-of-alignment cylinder may cause jamming as well. If jamming does occur, the tool often cannot be retrieved intact, resulting in destruction of an extremely expensive working tool.

A roller burnishing tool is typically inserted into the cylinder through a draw tube to align it with the interior of the cylinder. The draw tube has the same or nearly the same diameter as the cylinder, and the roller burnishing tool as described above will roller burnish the draw tube on each cycle. Eventually, the draw tube becomes oversized, and the draw tube will not accurately align the tool with the cylinder, again resulting in jamming.

Hollow cylinders are employed in various applications, including use as hydraulic and pneumatic cylinders. These cylinders vary in length from 31 inches to 24 feet. Diameters range from 2-7 inches. Both thin-walled and heavy wall cylinders are used, depending upon the specific application. Thin-walled cylinders are often advantageous because of weight and cost considerations while heavy walled cylinders may be necessary for applications requiring additional strength. However, both thin-walled and heavy walled cylinders exhibit characteristics causing jamming of the tool. Thin-walled cylinders tend to bow, causing the cylinder to become out of alignment with the tool. Heavy

walled cylinders tend to rotate during rotary operations, also resulting in the tool becoming out of alignment. In either case, the tool must be properly aligned and secured to avoid jamming, and resultant destruction of the expensive tool and work-piece.

Various improvements have been made adaptable for use with rotary skiving and roller burnishing apparatus. One such feature is described in U.S. Patent No. 4,425,893 entitled "Retractable Knife For Skiving Tool" issued on January 17, 1984, the disclosure of which is incorporated by reference.

A method and device for balanced centering of the workpiece, especially a crankshaft, is disclosed by EP 0268724 A1 (closest prior art). The workpiece is centered to rationalize and optimize the final balancing of the finishing of the workpiece. Imbalance due to regions of the workpiece that have to be machined before finishing are not taken into account for centering. EP 0268724 A1 is not usable for positioning a hollow cylinder for machining operations by rotary tool inside the cylinder.

It is an object of the invention to properly position and align a cylinder for rotary operation whereby bowing of the cylinder is minimized and the rotary operation is simple, reliable, efficient in operation and is easily set up.

This object is solved by the characterizing features of claim 1. Correspondingly, the present invention provides a centering stand for positioning a workpiece for rotary skiving and roller burnishing operations in a hollow cylinder. The centering stand properly positions the cylinder for rotary operations, minimizing bowing of the cylinder. Proper alignment of the cylinder affords an automated rotary skiving and roller burnishing apparatus which is simple, reliable and efficient in operation and is easily set up. Additionally, the centering stand of the present invention provides a consistent finish, and fast part cycle time.

The centering stand includes a conventional vice having a grip for maintaining the cylinder in proper centered and aligned position for rotary operations. A base plate is movable between a raised position supporting the cylinder and a lowered position removed therefrom. The base plate travels along a track formed between a plurality of guide members. The track is bounded by a recess formed in an inner surface of the guide members and a track plate mounted to the outer surface of each guide member. A positive positioning coupling properly aligns the cylinder for centered rotary operation.

The vice is movable with the base plate between a raised position maintaining the cylinder in centered alignment and a lowered position removed from the cylinder. A lift, preferably a hy-

draulic lift, operates to move the base plate and vice between the raised and lowered positions.

In the preferred embodiment, the positive positioning coupling includes a dovetail formed on an upper surface of the base plate cooperating with a lip disposed at the upper end of the guide members. The lip preferably projects in an inwardly direction toward the opposite guide member and downwardly so as to engage the dovetail.

The present invention may be adapted for use of thin-walled cylinders or for heavy stock removal on heavy wall cylinders. In the application for heavy wall cylinders, serrated teeth are employed to retain the cylinder preventing rotation during heavy stock removal.

Fig. 1 is a perspective view of the centering stand in combination with the rotary skiving and roller burnishing apparatus.

Fig. 2 is a side view of the centering stand of the present invention.

Fig. 3 is a front view of the present invention in which a cylinder is placed in the aligned position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to Fig. 1, the overall structure of rotary operation apparatus 6 will be described. Rotary skiving and roller burnishing operations are performed on a long cylinder 4. Apparatus 6 may be constructed to accommodate ranges of length of cylinder from 31 inches to 24 feet. Diameters of the cylinder may range from 2-7 inches. Apparatus 6 includes end clamping units 38, 38' positioned at opposite ends of apparatus 6 for adaption to varying lengths of cylinder 4. End clamping units 38, 38' are slidable along rails 40 to clamp the ends of varying length of cylinder 4. A support table 28 is disposed intermediate end clamping units 38, 38' for vertically supporting cylinder 4. Two centering stands 2, 2' are positioned at opposite ends of apparatus 6, on opposite sides of support table 28, between end clamping units 38, 38', as seen in Fig. 1.

Centering stands 2, 2' maintain cylinder 4 in proper centered and aligned position for performing rotary skiving and roller burnishing operations by rotary operation apparatus 6. For ease of discussion, only one centering stand 2 will be described in detail. It is to be understood that the centering stands 2, 2' at each end of apparatus 6 are identical.

Referring now to Figs. 2 and 3, centering stand 2 includes a conventional vice 8 for retaining cylinder 4 in its properly centered and aligned position as seen in Fig. 1 and in solid lines in Figs. 2 and 3. A base plate 10 supports vice 8 for performing rotary operations on cylinder 4. Base plate 10

is located to properly position vice 8 by positive positioning coupling 12. Positive positioning coupling 12 is formed between a plurality of guide members 14 and base plate 10.

Conventional vice 8 includes grips 26, 26' for automatically retaining cylinder 4 in its properly centered position. Grips 26, 26' are longitudinally opposed to each other. Grip 26 includes a V-shaped recess co-acting with a similar recess formed in opposite grip 26'. Opposed grip 26' is a mirror image of first grip 26. Each grip 26, 26' includes a plurality of teeth 32 and corresponding recesses 34 at each of its upper and lower ends. Teeth 32 prevent rotation of cylinder 4 in the case of heavy wall cylinders.

A hydraulic lift 16 moves base plate 10 and vice 8 in the direction of arrow A as seen in Fig. 2. Lift 16 has a raised position maintaining cylinder 4 in its proper centered and aligned position as seen in solid lines in Figs. 2 and 3 and a lowered position removed from the cylinder as seen in dashed lines in Figs. 2 and 3. Base plate 10 rests on guide plate 18 in its lowermost position.

Guide members 14 include a recess 21 formed on an inner surface 15 for accommodating travel of base plate 10 to an upper end 13 of guide members 14. A track plate 19 is mounted by screws 25 to each guide member 14, forming a track 20 between the guide members. Positive positioning coupling 12 includes a lip 22 and a dovetail connection 24. The lip 22 is disposed at upper end 13 of the guide members 14. Lip 22 extends inwardly toward the remaining guide members 14 and downwardly in the direction of guide plate 18. Dovetail 24 tapers downwardly, forming an angle of approximately 60° with track 20. Dovetail 24 is formed on an upper surface 9 of base plate 10 at an outer edge 11 of base plate 10. Dovetail 24 engages lip 22 so that base plate 10 is exactly horizontal and stops at the appropriate elevation. In this manner, during rotary skiving and roller burnishing operations, positive positioning coupling 12 holds cylinder 4 in perfectly centered and aligned position, preventing twisting, rotation and excessive vibration of the cylinder.

The operation of centering stands 2, 2' will now be described. A cylinder 4 is placed in load position on a pair of tube supports 36 of support table 28. Support table 28 moves to the left in the direction of arrow B, as seen in Fig. 1, to locate cylinder 4 in position for rotary operations. End clamping units 38, 38' squeeze cylinder 4, maintaining the positioning of the cylinder for start of the rotary skiving and roller burnishing operations. Conventional centering vices 8, 8' mounted on centering stands 2, 2' center cylinder 4 laterally in position to within 1/1000s of an inch. Vertical alignment is achieved by positive positioning coupling

12 disposed on centering stands 2, 2'. The operation of positive positioning coupling 12 will be described below. Precise alignment is required to ensure accurate rotary skiving and roller burnishing operations. Tube supports 36 are lowered, moving away from cylinder 4.

In the lowered position of centering stand 2, shown in dashed lines in Fig. 3, base plate 10 is positioned above guide plate 18. Lift 16 raises base plate 10 in track 20, along with vice 8 to its uppermost position for maintaining cylinder 4 in proper position. Dovetail 24 is received by lip 22 for ensuring proper elevational location of base plate 10 relative to guide members 14. Thus, positive positioning coupling 12 ensures alignment and centering of vice 8.

Vice 8 closes on cylinder 4 for maintaining the cylinder in its centered and aligned position for efficient operation of rotary skiving and roller burnishing apparatus 6. Once cylinder 4 is in its aligned position, a tool, not shown, cuts and finishes the inner surface of cylinder 4. A skiving element positioned on the tool cuts the inner diameter precisely to the desired size. Rollers mounted coaxially on the same drive shaft as the skiving element then burnish the inner surface of the cylinder. At the end of the traverse of the tool through the entire length of cylinder 4, the tool is withdrawn from cylinder 4, resulting in a smooth-finished, precision-bored cylinder.

Although the preferred embodiment employs a hydraulic cylinder, the lift of the centering stand may be of any type, for example, a pneumatic lift. Additionally, the track plate may be mounted to the guide members in any desired manner.

This invention has been described with reference to the preferred embodiment. Variations and modifications can be made without departing from the scope of the present invention, which is limited only by the following claims.

Claims

1. A centering stand for positioning a workpiece comprising a vice (8) including a pair of grips (26,26'), a base plate (10) for supporting said vice (8), said vice (8) being moveable with said base plate (10) between a raised position and a lowered position and guide members (14) for guiding said base plate (10), characterized in that said workpiece is a hollow cylinder that is positioned for machining operations by rotary tool, said grips (26,26') retain the cylinder (4) in a proper centered, aligned and non-rotatable position for rotary tool operation; said vice (8) is supported by the base plate (10) so that the cylinder (4) is non-rotatably retained in proper centered and aligned position; the cylinder is

maintained in the raised position in proper centered and aligned non-rotatable position, whereby said vice (8) is disengaged and spaced from the cylinder (4) in its lowered position; each of said guide members (14) include a track (20) formed on an inner surface (15) of said guide member (14) for movement of said base plate (10) in said track, and means (12) are formed in at least one of said guide members (14) for engaging said base plate (10) at its raised position to ensure centering and alignment of the cylinder (4) in proper position for rotary operations, thereby minimizing bowing of the cylinder.

2. A centering stand as defined by claim 1, characterized by said base plate (10) including a plurality of corners, whereby the plurality of guide members (14) are disposed at each corner of said base plate (10) and said track (20) is formed between said guide members on an inner surface (15) of said guide members (14).
3. The centering stand as defined by claims 1 or 2 wherein said base plate (10) includes a dove tail (24) formed on an upper surface (9) of said base plate and wherein said engaging means (12) includes cooperating means (22) operatively associated with said dove tail (24) formed in at least one of said guide members (14).
4. The centering stand as defined by claim 3 wherein said cooperating means (22) includes a lip disposed at an upper end (13) of each said guide member (14).
5. The centering stand as defined by claims 1 or 2 wherein said base plate (10) includes a plurality of corners each having a dove tail (24) formed on an upper surface (9) of the base plate (10) and wherein said plurality of guide members (14) includes a guide member positioned at each corner of said base plate (10), each said guide member (14) including a lip (22) disposed at an upper end (13) of said guide member, said lip (22) projecting inwardly towards the remaining guide members (14) and downwardly so as to engage said dovetails (24).
6. The centering stand as defined by claim 5 wherein said dovetails (24) taper at an angle of approximately 60 degrees from said track (20).
7. The centering stand as defined by claims 1 or 2 wherein said track (20) comprises a recess (21) formed on the inner surface (15) of each



12 disposed on centering stands 2, 2'. The operation of positive positioning coupling 12 will be described below. Precise alignment is required to ensure accurate rotary skiving and roller burnishing operations. Tube supports 36 are lowered, moving away from cylinder 4.

In the lowered position of centering stand 2, shown in dashed lines in Fig. 3, base plate 10 is positioned above guide plate 18. Lift 16 raises base plate 10 in track 20, along with vice 8 to its uppermost position for maintaining cylinder 4 in proper position. Dovetail 24 is received by lip 22 for ensuring proper elevational location of base plate 10 relative to guide members 14. Thus, positive positioning coupling 12 ensures alignment and centering of vice 8.

Vice 8 closes on cylinder 4 for maintaining the cylinder in its centered and aligned position for efficient operation of rotary skiving and roller burnishing apparatus 6. Once cylinder 4 is in its aligned position, a tool, not shown, cuts and finishes the inner surface of cylinder 4. A skiving element positioned on the tool cuts the inner diameter precisely to the desired size. Rollers mounted coaxially on the same drive shaft as the skiving element then burnish the inner surface of the cylinder. At the end of the traverse of the tool through the entire length of cylinder 4, the tool is withdrawn from cylinder 4, resulting in a smooth-finished, precision-bored cylinder.

Although the preferred embodiment employs a hydraulic cylinder, the lift of the centering stand may be of any type, for example, a pneumatic lift. Additionally, the track plate may be mounted to the guide members in any desired manner.

This invention has been described with reference to the preferred embodiment. Variations and modifications can be made without departing from the scope of the present invention, which is limited only by the following claims.

Claims

1. A centering stand for positioning a workpiece comprising a vice (8) including a pair of grips (26,26'), a base plate (10) for supporting said vice (8), said vice (8) being moveable with said base plate (10) between a raised position and a lowered position and guide members (14) for guiding said base plate (10), characterized in that said workpiece is a hollow cylinder that is positioned for machining operations by rotary tool, said grips (26,26') retain the cylinder (4) in a proper centered, aligned and non-rotatable position for rotary tool operation; said vice (8) is supported by the base plate (10) so that the cylinder (4) is non-rotatably retained in proper centered and aligned position; the cylinder is

maintained in the raised position in proper centered and aligned non-rotatable position, whereby said vice (8) is disengaged and spaced from the cylinder (4) in its lowered position; each of said guide members (14) include a track (20) formed on an inner surface (15) of said guide member (14) for movement of said base plate (10) in said track, and means (12) are formed in at least one of said guide members (14) for engaging said base plate (10) at its raised position to ensure centering and alignment of the cylinder (4) in proper position for rotary operations, thereby minimizing bowing of the cylinder.

2. A centering stand as defined by claim 1, characterized by said base plate (10) including a plurality of corners, whereby the plurality of guide members (14) are disposed at each corner of said base plate (10) and said track (20) is formed between said guide members on an inner surface (15) of said guide members (14).
3. The centering stand as defined by claims 1 or 2 wherein said base plate (10) includes a dovetail (24) formed on an upper surface (9) of said base plate and wherein said engaging means (12) includes cooperating means (22) operatively associated with said dovetail (24) formed in at least one of said guide members (14).
4. The centering stand as defined by claim 3 wherein said cooperating means (22) includes a lip disposed at an upper end (13) of each said guide member (14).
5. The centering stand as defined by claims 1 or 2 wherein said base plate (10) includes a plurality of corners each having a dovetail (24) formed on an upper surface (9) of the base plate (10) and wherein said plurality of guide members (14) includes a guide member positioned at each corner of said base plate (10), each said guide member (14) including a lip (22) disposed at an upper end (13) of said guide member, said lip (22) projecting inwardly towards the remaining guide members (14) and downwardly so as to engage said dovetails (24).
6. The centering stand as defined by claim 5 wherein said dovetails (24) taper at an angle of approximately 60 degrees from said track (20).
7. The centering stand as defined by claims 1 or 2 wherein said track (20) comprises a recess (21) formed on the inner surface (15) of each



guide member (14), and includes a track plate (19) mounted to an outer surface of the guide members (14) such that said base (10) vertically slides within said recess (21) and is retained within said track (20) by said track plate (19).

8. The centering stand as defined by claims 1 or 2 further comprising a lift (16) for moving said base plate (10) within said track (20).

9. A centering stand as defined by claim 8 wherein said lift (16) comprises a hydraulic cylinder.

10. The centering stand as defined by claims 1 or 2 wherein said vice (8) includes a V-shaped grip (26, 26') for preventing rotation of the cylinder (4).

11. A centering stand for automatically properly centering and aligning the position of the workpiece for rotary operations according to at least one of the former claims, characterized in that said centering stand (2,2') is used in a rotary device for performing skiving and roller burnishing operations on the workpiece for forming a hollow cylinder therefrom, whereby the rotary device includes a support table (28) for generally locating the workpiece (4).

Patentansprüche

1. Ständer zum Zentrieren von Werkstücken mit einem Schraubstock (8), welcher ein Paar von Einspannklemmen (26, 26') aufweist, einer Basisplatte (10) zum Tragen des Schraubstocks (8), wobei dieser mit der Basisplatte (10) zwischen einer angehobenen und einer abgesenkten Stellung bewegbar ist, und mit Führungen (14) zur Führung der Basisplatte (10),
dadurch gekennzeichnet,
daß das Werkstück ein Hohlzylinder ist, der zur Bearbeitung durch ein Drehwerkzeug positionierbar ist, daß die Einspannklemmen (26, 26') den Zylinder (4) in einer richtig zentrierten, ausgerichteten und undrehbaren Stellung zur Bearbeitung des Drehwerkzeug halten; daß der Schraubstock (8) durch die Basisplatte (10) so getragen ist, daß der Zylinder (4) undrehbar in richtig zentrierter und ausgerichteter Position aufgenommen ist; daß der Zylinder in der angehobenen Stellung in einer richtig zentrierten und ausgerichteten, undrehbaren Position verbleibt, wobei der Schraubstock (8) außer Eingriff und beabstandet zum Zylinder (4) in seiner unteren Stellung angeordnet ist; daß jede der Führungen (14) eine auf einer Innenfläche

(15) der Führung (14) gebildete Fahrbahn (20) zur Bewegung der Basisplatte (10) in dieser aufweist, und daß eine Einrichtung (12) in wenigstens einer Führung (14) zum Eingriff mit der Basisplatte (10) in ihrer angehobenen Stellung ausgebildet ist, um die Zentrierung und Ausrichtung des Zylinders (4) in richtiger Position zur Drehbearbeitung unter Minimierung einer Durchbiegung des Zylinders ausgebildet ist.

2. Ständer zum Zentrieren nach Anspruch 1, gekennzeichnet dadurch, daß die Basisplatte (10) eine Vielzahl von Ecken aufweist, wobei eine Vielzahl von Führungen (14) in jeder Ecke der Basisplatte (10) angeordnet ist und die Laufbahn (20) zwischen den Führungen auf einer Innenfläche (15) der Führung (14) gebildet sind.

3. Ständer zum Zentrieren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Basisplatte (10) in ihrer Oberfläche (9) einen Schwalbenschwanz (24) aufweist und die Eingriffsvorrichtung (12) eine Zusammenwirkungsanordnung (22) in wenigstens einer Führung (14) aufweist, die operativ dem Schwalbenschwanz (24) zugeordnet ist.

4. Ständer zum Zentrieren nach Anspruch 3, dadurch gekennzeichnet, daß die Zusammenbauanordnung (22) eine am oberen Ende (13) einer jeden Führung (14) angeordnete Lippe aufweist.

5. Ständer zum Zentrieren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Basisplatte (10) eine Vielzahl von Ecken aufweist, von denen jede einen Schwalbenschwanz (24) auf der Oberseite (9) der Basisplatte (10) aufweist, und wobei die Vielzahl der Führungen (14) ein Führungsbauteil aufweisen, das in jeder Ecke der Basisplatte (10) angeordnet ist, wobei jedes Führungsbauteil (14) an einem oberen Ende (13) eine Lippe (22) aufweist, welche nach innen in Richtung der verbleibenden Führungsbauteile (14) und nach unten zum Eingriff mit den Schwalbenschwänzen (24) gerichtet ist.

6. Ständer zum Zentrieren nach Anspruch 5, dadurch gekennzeichnet, daß die Schwalbenschwänze (24) unter einem Winkel von ungefähr 60° von der Fahrbahn (20) zugespitzt sind.



7. Ständer zum Zentrieren nach Anspruch 1 oder 2,
dadurch gekennzeichnet,
daß die Fahrbahn (20) eine Ausnehmung (21) auf einer Innenfläche (15) eines jeden Führungsbauteils (14) und eine Fahrbahnplatte (19) aufweist, welche an einer Außenfläche der Führungsbauteile (14) angeordnet ist, wodurch die Basisplatte (10) innerhalb der Ausnehmung (21) vertikal verstellbar ist und innerhalb der Fahrbahn (20) durch die Fahrbahnplatte (19) aufgenommen ist. 5 10
8. Ständer zum Zentrieren nach Anspruch 1 oder 2,
dadurch gekennzeichnet,
daß die Basisplatte (10) innerhalb der Fahrbahn (20) durch einen Lift (16) bewegbar ist. 15
9. Ständer zum Zentrieren nach Anspruch 8,
dadurch gekennzeichnet,
daß der Lift (16) einen Hydraulikzylinder aufweist. 20
10. Ständer zum Zentrieren nach Anspruch 1 oder 2,
dadurch gekennzeichnet,
daß der Schraubstock (8) eine V-förmige Einspannklemme (26, 26') zur Verhinderung einer Drehung des Zylinders (4) aufweist. 25 30
11. Ständer zum Zentrieren zur automatischen richtigen Zentrierung und Ausrichtung der Position eines Werkstücks zur Drehbearbeitung nach wenigstens einem der vorangehenden Ansprüche,
dadurch gekennzeichnet,
daß der Ständer (2, 2') zur Zentrierung in einer Drehbearbeitungseinrichtung zur Durchführung von Abschabungen und Drehpolieroperationen des Werkstücks zur Bildung eines Hohlzylinders verwendbar ist, wobei die Drehbearbeitungseinrichtung einen Tragtisch (28) zur allgemeinen Anordnung des Werkstücks (4) aufweist. 35 40 45

Revendications

1. Support de centrage pour positionner un ouvrage, comportant un étau (8) comprenant une paire de mors (26, 26'), une plaque de base (10) servant à supporter ledit étau (8), ledit étau (8) pouvant être déplacé avec ladite plaque de base (10) entre une position haute et une position basse, et des éléments de guidage (14) pour guider ladite plaque de base (10), caractérisé en ce que ledit ouvrage est constitué par un cylindre creux positionné en vue 50 55

d'opérations d'usinage au moyen d'un outil rotatif, lesdits mors (26, 26') maintenant le cylindre (4) en position centrée correcte alignée et non rotative en vue de l'opération d'usinage au moyen de l'outil rotatif, ledit étau (8) étant supporté par la plaque de base (10) de telle sorte que le cylindre (4) est maintenu non rotatif en position centrée et alignée correcte ; le cylindre étant maintenu en position haute non rotatif correctement centré et aligné grâce à quoi ledit étau (8) est désengagé et éloigné dudit cylindre (4) en position basse ; chacun desdits éléments de guidage (14) comprenant une voie de glissement (20) formée sur la surface intérieure (15) dudit élément de guidage (14) en vue du déplacement de ladite plaque de base (10) dans ladite voie de glissement, des moyens (12) étant formés dans au moins un desdits éléments de guidage (14) pour engager ladite plaque de base (10) en position haute et assurer le centrage et l'alignement du cylindre (4) correctement en vue des opérations d'usinage rotatif réduisant ainsi au minimum la flexion du cylindre.

2. Support de centrage selon la revendication 1, caractérisé en ce que ladite plaque de base (10) comporte une pluralité de coins permettant de disposer la pluralité des éléments de guidage (14) à chacun des coins de ladite plaque de base (10), ladite voie de glissement (20) étant formée entre lesdits éléments de guidage sur une surface intérieure (15) desdits éléments de guidage (14).
3. Support de centrage selon les revendications 1 ou 2, dans lequel ladite plaque de base (10) comporte une queue-d'aronde (24) formée sur une surface supérieure (9) de ladite plaque de base et dans lequel ledit moyen (12) de mise en prise comporte un moyen (22) de coopération et qui est associé en fonctionnement avec ladite queue-d'aronde (24) formée dans au moins un desdits éléments de guidage (14).
4. Support de centrage selon la revendication 3, dans lequel ledit moyen de coopération (22) comporte une patte placée à une extrémité supérieure (13) de chacun desdits éléments de guidage (14).
5. Support de centrage selon les revendications 1 ou 2, dans lequel ladite plaque de base (10) comporte une pluralité de coins muni chacun d'une queue-d'aronde (24) formée sur une surface supérieure (9) de la plaque de base (10) et dans lequel ladite pluralité d'éléments de guidage (14) comporte un élément de guidage



- positionné à chaque coin de ladite plaque de base (10), chaque élément de guidage (14) comportant une patte (22) disposée à une extrémité supérieure (13) dudit élément de guidage, ladite patte (22) formant saillie vers le haut dans la direction du prolongement des éléments de guidage (14) et vers le bas de manière à engager lesdites queues-d'aronde (24). 5
6. Support de centrage selon la revendication 5, dans lequel lesdites queues-d'aronde (24) sont biseautées suivant un angle d'environ 60 degrés depuis ladite voie de glissement (20). 10
7. Support de centrage selon les revendications 1 ou 2, dans lequel ladite voie de glissement (20) comporte un évidement (21) ménagé sur la surface intérieure (15) de chaque élément de guidage (14) et comprend une plaque formant rail (19) montée sur une surface extérieure des éléments de guidage (14) de telle sorte que ladite plaque de base coulisse verticalement à l'intérieur dudit évidement (21) et soit maintenue à l'intérieur de ladite voie de glissement (20) par ladite plaque formant rail (19). 15
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8. Support de centrage selon les revendications 1 ou 2, comportant en outre un dispositif de levage (16) pour déplacer ladite plaque de base (10) à l'intérieur de ladite voie de glissement (20). 30
9. Support de centrage selon la revendication 8, dans lequel ledit dispositif de levage comprend un vérin hydraulique. 35
10. Support de centrage selon les revendications 1 ou 2, dans lequel ledit étau (8) comprend des mors (26, 26') en forme de V pour empêcher la rotation du cylindre (4). 40
11. Support de centrage pour centrer et aligner correctement et de façon automatique un ouvrage en vue d'opérations d'usinage rotatif suivant une au moins des revendications précédentes, caractérisé en ce que ledit support de centrage (2, 2') est utilisé dans un dispositif rotatif pour effectuer des opérations de tronçonnage et de polissage à la meule flexible sur un ouvrage afin de former à partir de celui-ci un cylindre creux, le dispositif rotatif comportant une table support (28) pour positionner dans son ensemble l'ouvrage (4). 45
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