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(54) **A RING SPINNING AND TWISTING MACHINE**

RINGSPINN- UND ZWIRNMASCHINE

MACHINE A FILER ET RETORDRE A ANNEAUX

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Description

TECHNICAL FIELD :

[0001] This invention relates to a ring spinning and twisitng machine. Ring spinning and twisting machines are used for the production of short staple or long staple from roving or from sliver. Conventional ring spinning machine has a plurality of spindles mounted on a ring frame and the yarn produced is wound on bobbins provided on these spindles.

BACK GROUND ART:

[0002] Long length spinning frames housing at elast a thousand spindles are very common now. Though there are practical problems associated with operating a large number of spindles, due to considerable reduction in cost, operation, maintenance and space, the trend in textile industry is for multiple spindle ring spinning machinery.

[0003] A major drawback while operating long spinning frmes with a large number of spindles is the considerable downtime for cleaning and maintenance. Stoppage of the machine is also necessary during piecing of yarn. Simultaneous piecing of yarn produced on both sides of the ring spinning machine would require more man power. Drive also requires to be disengaged or engaged manually.

[0004] During spinning session, while the yarn is being wound in an empty cop, it is essential for the bottom of the yarn package to have higher yarn content than the corresponding top portion of the package which has relatively lesser yarn content. This precondition is eessential to avoid frequent end breaks during spinning operations. In order to achieve this, the spindle is allowed to run initially at a slower speed for a predetermined period of time depending on the length of the yarn that is being processed. The speed is varied after the desired package content is obtained.

[0005] In conventional machines, the main drive is translated to the spindle through a variating means. This variator means has top and bottom pulleys connected by a 'V' shaped belt driving medium. The top pulley is made up of two separate discs with adjustable means for reducing or increasing the distance between the two discs. This reduction or increase of distance between the discs results in the up or down movement of the V belt, thereby effecting a change in the driving diameter of the top and bottom pulleys causing speed variation. Thus, when the discs are closer, the rotational diameter of the top pulley increases and that of the bottom pulley decreases thereby causing an increase in the speed of the bottom pulley. On the other hand when the distance between the disc is increased, the rotational diameter of the top pulley reduces and the speed of the bottom pulley consequently becomes slower. The variation in spindle speed is achieved by connecting the main drive means to the top pulley and the spindle to the bottom pulley of the variator. One disc is fixedly mounted and the other disc is connected to an adjusting hand which is actuated by pneumatic means, thus enabling adjustment of the distance between the two discs. However, this system affords only two speed variations. Because of the two step limitation, the production speed is limited and cannot be optimized for higher productivity. Further developments were made to overcome this limitation so that multiple step speeds were made possible. The above developments require input of values of the delivery length and step increase by the user. The speed changes obtained by this method is not in small values and causes higher yarn tension possibly leading to more end breaks. Further, the speed instability of the system leads to hunting. Hunting reduces the yarn quality and the life of the machinery. Another drawback of this system is in the time consuming process of keeping the flow valve frequently tuned.

[0006] Preconditioning involves time and loss of production due to consequential and unavoidable down timing of the machine.

[0007] Ideal ring and traveller combination in a ring spinning and twisting machine must result in high spindle speed. Whenever a new machine is commissioned with new rings or whenever ring replacement is required due to wear and tear, a running in period varying from 1 to 32 days is unavoidable till maximum spindle speed is achieved. Under ideal conditions, this running-in-period is to be kept to the minimum. Further, conventional rings limit the speed of the traveller and as the life of the traveller is prolonged, yarn quality is deteriorated resulting in end breaks and hairiness. Yet another draw back noticed while using conventional ring is that the same ring may not be adequate for processing materials of different counts. For satisfying the above discussed ideal condition in ring spinning and twisting machine, the spinning tension must be limited to

$$S \frac{m\mu\ mv^2}{\text{Sin}\ \alpha\ r}$$

wherein

$m\mu$ = coefficient of friction between ring and traveller
α = angle of yarn pull
m = traveller mass in mg
v = traveller speed mm/sec
r = radius

[0008] From this formula, it is olear that to achieve higher spindle and traveller speed to result in maximum production efficiency, it is essential to keep friction to the minimum, keep weight of the traveller to the minimum while maintaining the unit area to keep traveller wear under control and to maintain the angle greater than 30 degrees by carefully selecting the ring diameter. It is also

essential to keep the balloon tension/air resistance to the minimum possible level by using rings of smaller diameter and tubes of shorter lengths. Ring and traveller assembly must have high wear resistance, good heat dissipation characteristics, homogenous structure, corrosion resistance and easy manufacturability.

[0009] The step of ring changing involves a number of operations that require preliminary work. For example, the drive to the drafting system must be disengaged, the drive to the ring rail must be disengaged, power supply to the relevant machine parts must be stopped, the ring rail must be raised to the desired position, and the spindle speed must be regulated. The operator has to rotate the lappet assembly manually during these operations. After completion of the process of ring centering, these sequence has to be repeated and the machine reset to the desired starting position before commencing spinning operations. Manual operation of these sequences increase the downtime of the machinery leading to production losses. The present system is also labour intensive in nature.

[0010] In textile spinning, doffing cycle involves removal of full cops from spindles and placement of empty cops thereon for the next cycle of operation. Automatic doffing has now become common in modern textile industry. Sequence of preliminary operations required for automatic doffing are transporting the full cops removed from the spindle to the next stage of operation, bringing in the empty cops and keeping empty cops at an intermediate location for replacement.

[0011] In conventional top arms, locking and loading are effected by a thumb means which is pneumatically actuated. Loading and locking means in the known top arm arrangement consists of a thumb actuated by pneumatic means having a cam joint to the handle of the top arm. The thumb transmits its load to the handle and when the handle is locked with the top arm, the load is transmitted to the top arm for pressing the top arm rollers against the corresponding bottom rollers. The top arm and the thumb are fulcrumed on a fixed bracket to enable the above loading.

[0012] Since both these functions are effected by the same means, functional variation of one factor may result in manufacturing defects. For instance, defective locking would result in the variation of top roller load on the corresponding bottom rollers. Any manufacturing defect in any of the contributing components such as thumb, handle, load arm or fixed brackets may cause defective locking. It is also observed that roller diameter varies due to wear and tear leading to ineffective locking between the two sets of rollers. Yet another drawback noticed in the existing system is that any small variation of the components reflects considerably on effective loading. This is attributed to the relatively short distance between the levering elements such as the thumb and the handle or the handle and its fulcrum.

DISCLOSURE OF THE INVENTION:

[0013] Attempts have been made by applying surface coating to the ring and traveller assembly to reduce friction and heat dissipation capacity. But the coating hitherto used have not been found to fully satisfy the above referenced requirements and overcome the problems associated with conventional ring and traveller assembly. Conventional coatings hitherto known in the art, chip off or peel off while in operation, adding to the existing problems.

[0014] In order to overcome the problems discussed hereinbefore, a ring coated with amorphous hydrogenated carbon which is known in the art as diamond like carbon (DLC). DLC is preferably coated on the ring using plasma assisted chemical vapour deposition technique. A deposit of about 4 μm thickness is formed on the ring surface by this technique which is operable at low temperatures.

[0015] In a specific embodiment the ring may have an ovality of 0.1mm, roundness of 90 microns and surface roughness of Ra 0.05 and hardness of 750 to 2000 HV. The width of the flange may be atleast 3.2 mm + 0.05-0 mm and base flatness is 0.01 mm. Hydrogenated carbon film coating has a thickness of 2 to 3 microns and hardness of 2000 Wmk-2.

[0016] The traveller also may be coated with the DLC using the same plasma coating process. The coating on the traveller may preferably have a thickness of 1 to 2 microns and hardness of 1000 to 1500 KV.

[0017] Speed variation system which is oontrolled, programmed and net worked has been developed to overcome the aforementioned drawbacks of the existing system. The control and program means create automatically smooth speed curve and convert them into pulses for actuating conventional speed regulating means,thereby avoiding abrupt change in speed and hunting associated with conventional systems.

[0018] The speed variation system for textile machines, according to this invention comprises variator means, control means, programme means and valve means, wherein said control means is capable of measuring and storing spindle speed of said textile machine, said programme means is capable of generating smooth speed pulse signals from the speed data supplied thereto, by said control means to actuate the valve means through pulse train for regulating said variator.

[0019] The variator may be pneumatic variators known conventionally in the art having two pulleys connected by a 'V' belt drive where one of the pulleys has adjustable means for varying the rotational diameter of the 'V' belt. This pneumatic actuation may be a close loop system for receiving commands continuously from the control means for monitoring speed variation and for adjusting pulse supply for smooth control.

[0020] Alternatively, the variator may consist of a cone dirve system comprising two cones arranged one above the other in the opposite direction. These cones are con-

nected by a flat belt means having means for moving the belt through the length of the cones for changing the diameters of the drive and the driven means.

[0021] The control means is a programable microprocessor. This control and the programme means are capable of storing a plurality of parameters and are designed to copy programmes between machines. This enables networking and replacement of one programme value by another. Operation of machines of any desired destination becomes possible through networking.

[0022] The means for sequentially loading and unloading oops in a spinning machien developed by us overcomes the above discussed drawbacks and disadvantages. The base plate of the peg tray is designed to have atleast two elevated profiles symmetrically disposed thereon. The pegs are arranged to sit on these profiles so that the contact between the peg and tray is restricted to the elevated profile area of the tray thereby reducing the friction considerably. Plurality of perforations are introduced on the base plate of the tray to prevent congestion due to accumultion of fluff thereon during operation. In yet another embodiment, the gripper rail of the doffer is lowered such that each of the empty cops in the tray is encapsulated by the gripping means when idle or disabled. The freedom of movement of the empty cops during operation is thereby restricted within the limits of the disabled or idle gripping means thereby avoiding fall or limiting the movement of the empty cops. The surface of the peg rail may be coated with smooth electroless nickel coating upto 5 micron thickness.

[0023] Yet another improvement is in providing a simple bevel gear arrangement for controlling the swing in and swing out movement of the gripper arm and gripper means of the doffing device by means of level gear arrangement and linkage. This affords smooth swing-in and swing-out operation and avoids complicated and separate devices for controlling the movement.

[0024] Programmed control means are provided for defining and calculating the different position of the gripper movements such as empty gripping position intermediate empty cop dropping position, full cop gripping position, full cop dropping position, empty cops gripping position at intermediate rail, swing-in position as well as empty cops doffing position on spindles for different spindle lift sizes. Lifting and covering of the gripper arms are also controlled and synchronised by programmed control means such as micro processor.

[0025] Automatic electronic contol and programming of the existing system developed by us simplifies the ring changing operations resulting in reducing downtime and increasing production output. Other advantages of automatic centering are ease of operation and reduction of human errors and inaccuracies.

[0026] The means for ring centering in a ring and twisting machine according to this invention comprises program means, control means, actuator means and authentication means, said program means and control means actuating said actuator means to disengage the drafting drive and the drive to the ring rail, disconnecting power supply to suction means, raising the ring rail to the desired position and setting the spindle speed to enable ring centering and thereafter repeating the sequence to reset the machine to its original position.

[0027] The program means may also be provided with antiballoon control ring centering program which is operable either prior to or after ring centering. The program and control means may also be provided with programs for lifting and tilting the lappet for ring centering.

[0028] Authentification means are provided for enabling only authenticated persons to operate the machine with the help of a selected password.

[0029] Known control means, program means and actuating means are usable in this system which may be programmed to function as desired.

[0030] Yet another improvement is the top arm assembly for a textile spinning machine having independent locking and loading means. This means comprises a support frame provided with a loading lever pivoted thereto, one end of said loading lever is connected to loading means, and the other end to load distribution means, and a locking means consisting of a locking lever movably connected to a locking cam fixedly mounted on said support frame.

[0031] The subject invention discloses yet another top arm assembly intended for overcoming the drawbacks and disadvantages of the existing top arm system. Pressure on the bottom rollers are applied through saddles. Loading function is acheived by horizontally mounted modules having spring means which can be adjusted. Spring loading is transmitted to the saddles through pressure thumbs. Loading brackets pivoted to the mounting means and disposed perpendicular thereto transmit the load to the saddle provided with a set of top rollers. Each modular loading means is located to relate to the corresponding bottom roller. The mounting and loading brokets are pivoted such that the distance between the thumb and the pivoting point and the distance between the pivoting point and the distribution point is equal so that the spring load produced is equal to the load desired.

[0032] The loading lever is pivoted to a support member and is kept rigid by engaging the locking lever with the fixed rocking cam in the support member. The top arm can be kept upright and unlocked by disengaging from the fixed cam and placing the lever on top of the cam.

[0033] The top arm assembly for textile machines having modular loading means according to this invention comprises a support member having a loading lever provided with atleast one horizontally disposed mounting means, each said mounting means having a spring actuated pressure thumb, an adjusting means and loading bracket terminating in a saddle and top rolelr assembly and a locking lever movably disposed on a locking cam fixed on said support member.

[0034] Drawbacks of the existing spinning frame by

driving bottom rollers on both sides of the spindle by independent driving means provided on each end. Bottom rollers are also segmented such that stopping of one set of rollers would not affect the running of the other rollers on the same or opposite sides. Maintenance schedule also may be preprogrammed for sequentially engaging and disengaging each segment of the rollers such that during the maintenance of one set of rollers, the production and running of the other portions of the machine are not affected. The downtime is thereby reduced as much as 50%.

[0035] Ring frames are provided with plurality of suction tubes below the bottom cylinder to suck the fibres in case of end breaks. In longer machines, the suction pressure at the suction tubes drop significantly at the far end of the suction system. The suction efficiency is considerably improved as suction systems are provided on both ends of the machine deviced by us.

[0036] Conventional spinning machines are provided with spindles in a row on both sides of the longitudinal section. The front roller of the drafting zone is arranged diagonally above the spindle. The drafted roving travels through the front roller and reaches the spindle through a lappet arranged in alignment with the centre of the spindle. During operation, lappet travels up and down to introduce a twist in the yarn, upto the nipping points. This also helps to maintain uniform tension in the yarn for winding it on a bobbin mounted on the top part of the spindle. Angles formed by the yarn in respect of the vertical plane of the lappet is known as the spinning angle and is determined by the height and distance between the nipping point of the yarn in the front roller and the centre point of the lapper.

[0037] Document DE 195 00 036 discloses a ring spinning and twisting machine according to the preamble of claim 1.

[0038] A main object of this invention is to provide multiple spinning angles to enable the operation of the machine interchangeably between these spinning angles, depending on the count and quality of the yarn to be processed. A set os interchangeable spinning boxes having at least two types of spinning boxes of different width and mounting holes are provided for modifying the spinning angle desirably. Mounting holes are provided at different heights for increasing/decreasing the distance between the nipping points of the front rollers and lappet. For instance, a spinning box with higher width increases the distance between the spindles on two sides of the machine and reduces the distance between the nipping point and lappet. The height between the front rollers and the leppet is increased/decreased by selecting the mounting holes. The side of the spinning box near the spinning rail has at least two mounting holes or means. These spinning boxes are located between the spindle rail and an intermediate frmae and has at least three mounting means holes at the side facing the intermediate frame.

[0039] In conventional spinning machines, the roving passes between cots and aprons in the drafting zone through a condensing means. If the roving travels on a single path, considerable roving breaks occur. This also reduces the life of the cot; condensing roving bars are continuously travered to allow the roving to pass through a predetermined width. Primary and secondary traversing are already known in the art. The speed of this primary and secondary traversing is preset. This invention provides means for changing the preset speeds of primary and secondary traversing of the condensing bar based on the yarn count to be processed. A control system consisting of a programmble microprocessor connected to a voltage source, linear actuator and a position sensor is connected to the shaft for controlling the speed of primary and secondary traverse. Smaller stroke lengths are achieved by controlling the voltage of the drive.

[0040] In another embodiment, this invention provides programmable control means for lifting the ring rail to the desired level for traveller replacement. The program and control means has a warning system such as a warning light to indicate that traveller replacement is due. After such replacement, the ring rail is automatically restored to the actual position.

[0041] In yet another embodimet, air used for cooling the main motor is recycled to cool the control panels and servomotors.

[0042] The control system is programmed for periodic maintenance schedule with automatic warning and display device. Details of process parameters, downloading data and net working means are provided in the control means which is a microprocessor.

[0043] Accordingly the invention provides a ring spinning and twisting machine according to the subject matter of claim 1.

BRIEF DESCRIPTION OF DRAWINGS:

[0044]

Fig 1 is the block diagram of the speed variation system wherein the variator is the pulley drive means with a 'V' belt.

Fig 2 is the block diagram showing the speed variator system having a cone drive means with a flat belt.

[0045] In fig 1, the block C_y stands for the cylinder to which the system S consisting of control means, programme means and valve means are connected. The system is actuatably connected to the pneumatic means consisting of discs D D'. M stands for the motor and B the belt drivably connected to the pneumatic means. Depending on the pulse signals transforming smooth speed curve, the distance between discs D and D' is altered causing the belt to move up or down. As already stated when the discs are closer, the rotational diameter of top pulley increases and the bottom pulley decreases,

resulting in speed change. Since the signals are regulated and abrupt change is avoided. The valve in the system may be electronically controlled to transmit pulses for actuating the pneumatic means.

[0046] In fig. 2, C_y, S, N and B represent the cylinder, the system, the motor and the belt, C and C' are the cones of the drive arranged one above the other.

[0047] Fig 3 shows a peg which is disposable on the peg tray in figure 4. Peg tray is indicated by the letters PT. P_1 and P_2 show the projections disposed longitudinally on the base of the peg tray. Reference letter H shows multiple perforations provided on the base plate of the peg tray.

[0048] Fig 5 represents a section of the peg tray to show the projections P_1 and P_2.

[0049] Fig. 6 describes the swing-in and swing-out arrangement of the cop loading and unloading means. GM_1 and GM_2 show the gripping means mounted on gripping arms represented by GA_1 and GA_2. BGA represent the bevel gear assembly connected to the gripping arm through actuating link shown by reference letters AL and carryover lever shown by COL. The gear arrangement in coordination with the actuating link and levers ensures smooth swing-in and swing-out of the gripper arm.

[0050] Fig 7 shows the top arm assembly in the loaded and locked position. The loading lever is indicated by numeral (1) and the locking lever by numeral (2). The support member is shown by numeral (5). The fixed locking cam is shown by (3) and the locking roller for engaging and disengaging the locking lever and the loading lever is shown by numeral (4). Mounting brackets of the modular loading means is shown by numeral (7) and the adjusting means located on the spring to adjust the load is shown by numeral (8). The loading bracket and saddle are shown by reference numeral (9) and (12) while the pressure thumb is shown by numeral (10). A wear pad (10) is located between the loading bracket and the pressure thumb to avoid direct contact between them. The support frame is mounted on a guide tube indicated by reference numeral (5). The locking lever is operable independently of the loading lever.

[0051] Fig 8 shows the top arm assembly in the loaded and looked position loading lever is shown by reference numeral 1 and is pivoted on to a support frame indicated by reference numeral 5 at any one of the multiple pivoting points shown by numeral 13. The support frame may consist of a top setting bracket and a bottom setting bracket. One end of the loading lever is connected to load distributors shown by reference numeral 14. Load distributors are provided with a set of top rollers. The other end is connected to a loading means. A specific embodiment of the loading means is a linear moving plunger type pressure thumb shown by reference numeral 15. Loading is effected pneumatically by inflated pressure hose 16 connected to the plunger Bearing 17 fixed to a guide tube 5 in the plunger housing enables linear movement of the pressure thumb. The loading point between the pressure thumb and the loading lever is provided with wear pad rolling mechanism. The wear pad 18 is fixed to the pressure thumb while the freely rotating roller 19 of the mechanism is fixed to the loading lever to ensure smooth contact at a defined point. Reference numeral 20 indicates a pressure ledge in which the pressure thumb is rigidly positioned. The pressure ledge 20 and the pressure thumb is positioned inside the guide tube. This avoids variation due to tilting of the pressure ledge. In the loaded condition, the pressure ledge does not establish any contact with the pressure tube while, when the pressure hose is deflated, the pressure thumb does not fully rest on the pressure tube for ensuring the orientation and positioning of the pressure ledge.

[0052] The locking means of the assembly is also mounted on the support frame 6. The locking lever is indicated by reference numeral 2. The support frame is pivoted with setting piece 21 which engages the locking lever 2 and the locking cam 3. When the locking lever engages with the fixed locking can it locks the supporting frame in position. The top are assembly may be kept in the upright position by disengaging the locking lever and positioning it on top of the fixed cam. The top and the bottom brackets may be engaged or disengaged by operation of the locking and loading levers.

[0053] Fig 9 is a sectional view which shows the spinning zones on both the sides of the machine. The incoming moving is indicated by reference numeral (22). The roving is guided by means of top arm (2) to front, middle, rear and bottom rollers represented by F, M, R and B respectively. Suction channel is shown by numeral (24). Spindle indicated by reference numeral (25) is driven by tape driving means 26. Nuneral 32 indicates mounting means for mounting the spindle 4. Spinning box is indicated by numeral 27. The intermediate frame drive shaft and the intermediate frame member are indicated by reference numerals 28 and 29 respectively. Numerals 30 and 31 represent the lappet and the spindle rail respectively.

[0054] Fig 10 shows the circuit diagram by the control means for controlling the speed of primary and secondary traverse of the condensor.

[0055] C represents the programmed microprocessor control unit which is connected to V, a voltage source. LA is a linear actuator connected to the voltage source and S is the sensor for position sensing. The circuit is connected to the shaft Sh of the drive and the voltage is regulated to increase or decrease the speed of primary and secondary traverse as desired.

Claims

1. A ring spinning and twisting machine having spinning zones on both sides of the machine, the machine comprising a surface coated ring and/or traveller assembly, a plurality of spindles (4) mounted

on both sides of the machine, means for automatically varying and controlling the spindle speed, means for sequentially and automatically loading and unloading cops during the spinning operation, automatic ring centering means, a top arm assembly having independent locking (2) and loading (1) means, said top arm assembly being provided with modular loading means, the longitudinal side of a ring frame of said ring spinning machine having an intermediate frame (9) connected thereto, a drafting zone consisting of a set of rollers (F;M;R;B) disposed diagonally above each spindle (4) of said spinning zone, said draft rollers (F;M;R;B) being segmented into at least two separately drivable groups on both sides of said ring frame, drive means and synchronising means for individually driving said segmented rollers, and a traversing condenser, said ring spinning and twisting machine also being provided with control and regulating means for controlling the speed of primary and secondary traversing of the condenser, **characterised in that** the machine is adapted to receive one of a plurality of interchangeable spinning boxes (27) of different widths, the sides of said boxes (27) adjacent to said intermediate frame member (28) and the sides opposite thereto having mounting holes at differing positions and wherein each spinning box (27) adjacent said frame (9) and the sides opposite thereto includes at least two mounting holes.

2. A ring spinning and twisting machine as claimed in Claim 1, **characterised in that** the drafting rollers include rear, middle and top pairs of drafting rollers (F;M;R;B), and **in that** the differing width dimension of each of the spinning boxes (27) is such that the horizontal distance between the lappet (30) and the nipping point of the front drafting rollers can be varied.

3. A ring spinning and twisting machine as claimed in Claim 1, **characterised in that** the drafting rollers (F;M;R;B) includes a front pair of drafting rollers and **in that** the differing mounting hole locations of each of the spinning boxes (27) allows for the vertical distance between the lappet (30) and the nipping point of front drafting roller to be varied.

4. A ring spinning and twisting machine as claimed in Claim 1, 2 or 3, wherein each spinning box (27) includes at least three mounting holes.

Patentansprüche

1. Ringspinn- und Zwirnmaschine mit Spinnzonen auf beiden Seiten der Maschine, wobei die Maschine umfasst: eine oberflächenbeschichtete Ring- und/oder Läuferbaugruppe, eine Vielheit von Spindeln (4), die auf beiden Seiten der Maschine montiert sind, Mittel für automatisches Variieren und Steuern der Spindeldrehzahl, Mittel für sequenzielles und automatisches Aufstecken und Abnehmen von Kopsen während des Spinnvorgangs, automatische Ringzentriermittel, eine obere Armbaugruppe mit unabhängigen Verriegelungsmitteln (2) und Belastungsmitteln (1), wobei besagte obere Armgruppe mit modularen Belastungsmitteln versehen ist, die Längsseite eines Ringrahmens der besagten Ringspinnmaschine einen daran angeschlossenen Zwischenrahmen (9) aufweist, eine Verzugszone, die aus einem Satz Walzen (F;M;R;B) besteht, die diagonal über jeder Spindel (4) besagter Spinnzone angeordnet sind, besagte Verzugswalzen (F;M;R;B) in wenigstens zwei separat antreibbare Gruppen auf beiden Seiten des besagten Ringrahmens segmentiert sind, Antriebsmittel und Synchronisiermittel zum individuellen Antreiben besagter segmentierten Walzen und eine Nitschelwalze, wobei besagte Ringspinn- und Zwimmaschine außerdem mit Steuer- und Regelmitteln zum Steuern der Geschwindigkeit der primären und sekundären Changierung der Nitschelwalze versehen ist, **dadurch gekennzeichnet, dass** die Maschine angepasst ist eine Vielheit auswechselbarer Spinnboxen (27) verschiedener Breiten aufzunehmen, wobei die Seiten der besagten Boxen (27), die an besagtes Zwischenrahmenelement (28) und die dazu gegenüberliegenden Seiten angrenzen, Montagebohrungen an unterschiedlichen Positionen aufweisen und wobei jede Spinnbox (27), die an besagten Rahmen (9) und die dazu gegenüberliegenden Seiten angrenzt, mindestens zwei Montagebohrungen einschließt.

2. Ringspinn- und Zwimmaschine wie in Anspruch 1 beansprucht, **dadurch gekennzeichnet, dass** die Verzugswalzen hintere, mittlere und obere Paare von Verzugswalzen (F;M;R;B) einschließen und, dass die unterschiedliche Breitenabmessung jeder der Spinnboxen (27) so ist, dass sich der horizontale Abstand zwischen dem Fadenführer (30) und dem Klemmpunkt der vorderen Verzugswalzen variieren lässt.

3. Ringspinn- und Zwirnmaschine wie in Anspruch 1 beansprucht, **dadurch gekennzeichnet, dass** die Verzugswalzen (F;M;R;B) ein vorderes Paar Verzugswalzen einschließen und, dass die unterschiedlichen Montagebohrungspositionen jeder der Spinnboxen (27) das Variieren des vertikalen Abstands zwischen dem Fadenführer (30) und dem Klemmpunkt der vorderen Verzugswalzen berücksichtigen.

4. Ringspinn- und Zwimmaschine wie in Anspruch 1, 2 oder 3 beansprucht, wobei jede Spinnbox (27)

mindestens drei Montagebohrungen einschließt.

Revendications

1. Une machine à filer et à retordre à anneaux, ayant des zones de filage des deux côtés, la machine comprenant un anneau ayant un revêtement de surface et/ou un ensemble à curseur, un nombre de broches (4) montées sur les deux côtés de la machine, un moyen pour varier et régler automatiquement la vitesse de la broche, un moyen pour charger et décharger séquentiellement et automatiquement les canettes pendant l'opération de filage, un moyen annulaire de centrage automatique, un ensemble de bras supérieur, pourvu de moyens de verrouillage (2) et de moyens de chargement (1), cet ensemble de bras supérieur étant pourvu de moyens de chargement modulaires, le côté longitudinal d'un châssis de cette machine à filer ayant un châssis (9) intermédiaire y connecté, une zone d'étirage consistant en une série de rouleaux (F; M; R; B), disposés diagonalement au-dessus de chaque broche (4) de la zone de filage, ces rouleaux de tirage (F; M; R; B) étant segmentés en au moins deux groupes pouvant être étirés séparément sur les deux côtés du châssis annulaire, un moyen d'entraînement et de synchronisation pour entraîner individuellement les rouleaux segmentés, et un condensateur à chariot; la machine à filer et à retordre à anneaux et à retordre étant aussi pourvue de moyens de règlement et de contrôle pour contrôler la vitesse du passage primaire et secondaire du condensateur, **caractérisée en ce que** la machine est adaptée pour recevoir une d'un nombre de boîtes (27) de filage interchangeables, de largeurs différentes, les côtés de ces boîtes (27) étant adjacents au membre intermédiaire (28) du châssis et les côtés y opposés comportant des orifices de montage à des positions différentes et dans laquelle chaque boîte de filage (27) adjacente à ce châssis (9) et les côtés y opposés comprennent au moins deux orifices de montage.

2. Une machine à filer et à retordre à anneaux selon la revendication 1, **caractérisée en ce que** les rouleaux d'étirage (F; M; R; B) comprennent des paires de rouleaux d'étirage, d'arrière, de milieu et de haut, et **en ce que** les largeurs différentes de chacune des boîtes de filage (27) sont telles que la distance horizontale entre le volet (30) et le point de pinçage des rouleaux d'étirage avant peut être ajustée de différentes façons.

3. Une machine à filer et à retordre à anneaux selon la revendication 1, **caractérisée en ce que** les rouleaux d'étirage (F; M; R; B) comprennent une partie antérieure de rouleaux d'étirage et **en ce que** les locations d'orifices de montage différents dans chacune des boîtes (27) de filage permettent d'ajuster de façon variable la distance verticale entre le volet (30) et le point de pinçage du rouleau d'étirage antérieur.

4. Une machine à filer et à retordre à anneaux selon la revendication 1, 2 ou 3, dans laquelle chaque boîte de filage (27) comprend au moins trois orifices de montage.

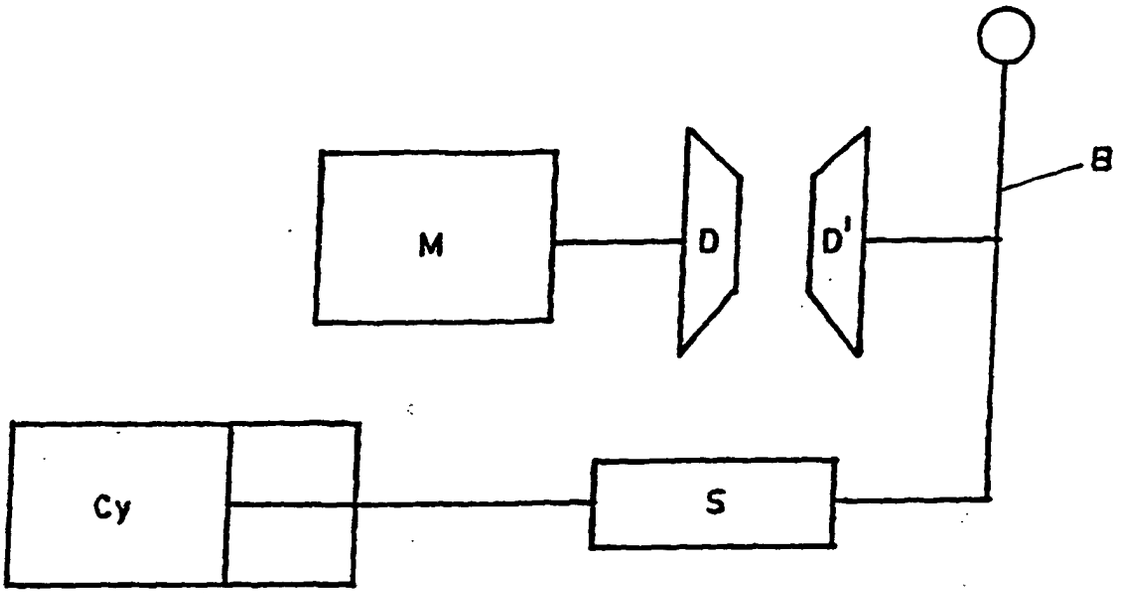


FIG - 1

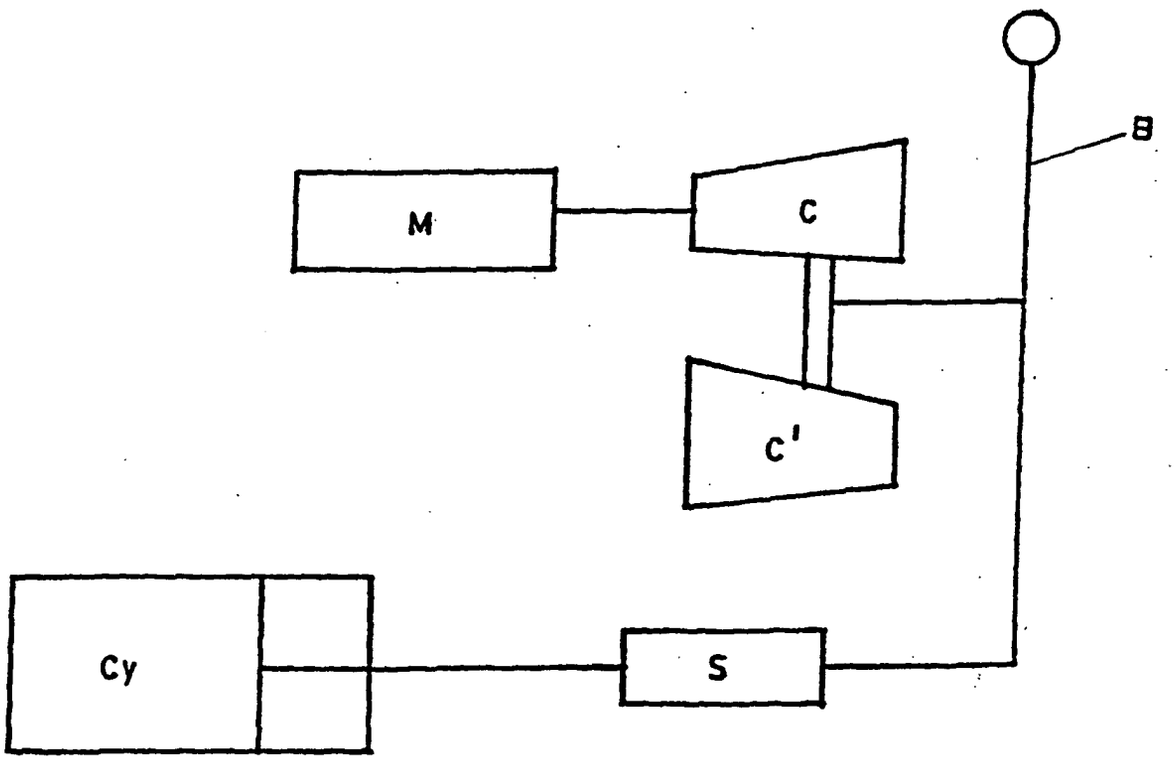


FIG - 2

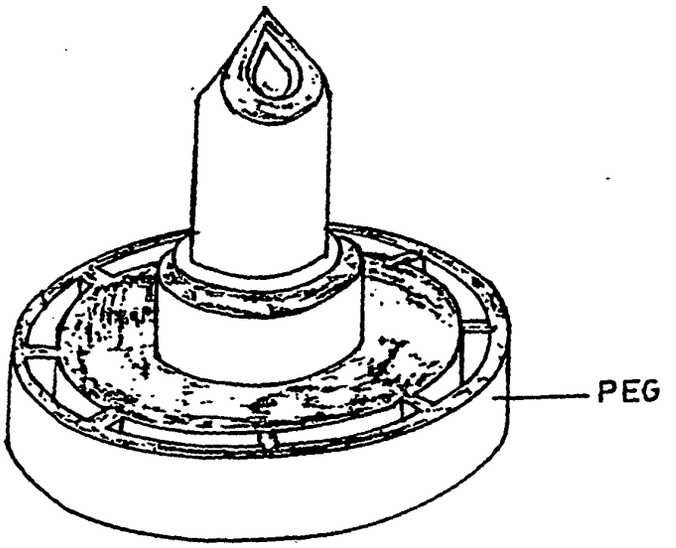


FIG - 3

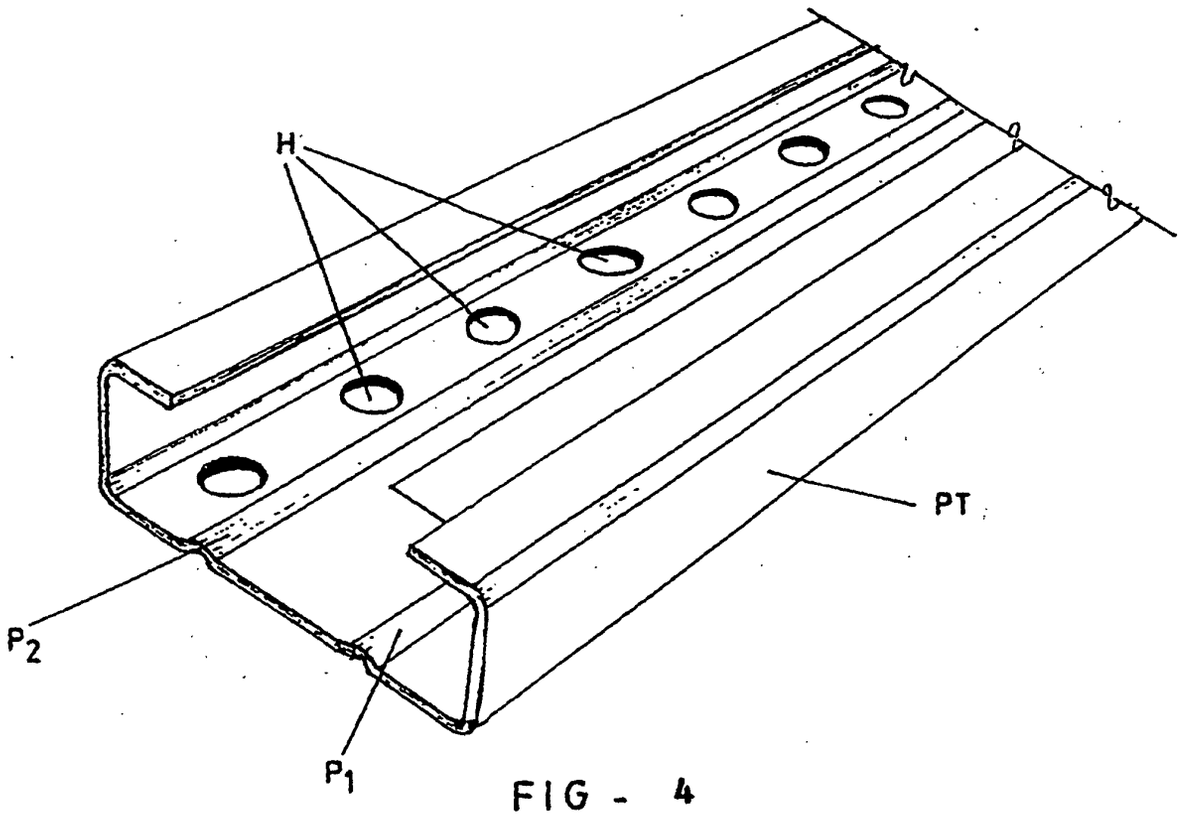


FIG - 4

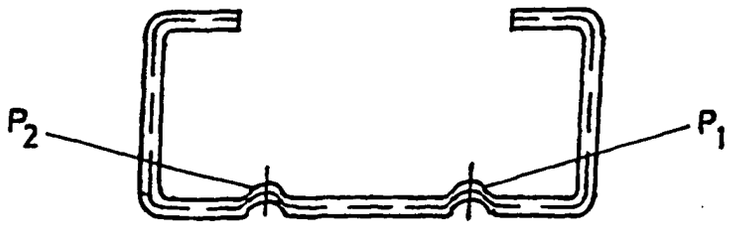


FIG - 5

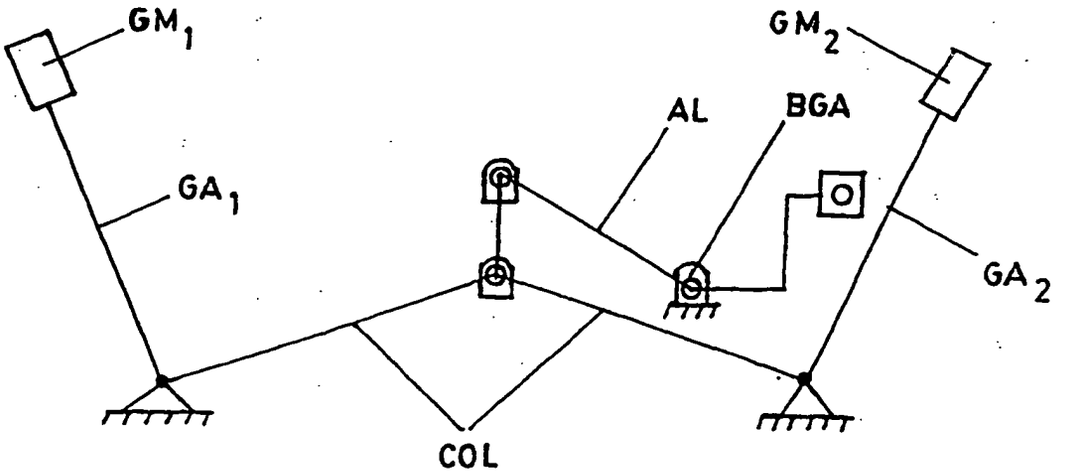


FIG - 6

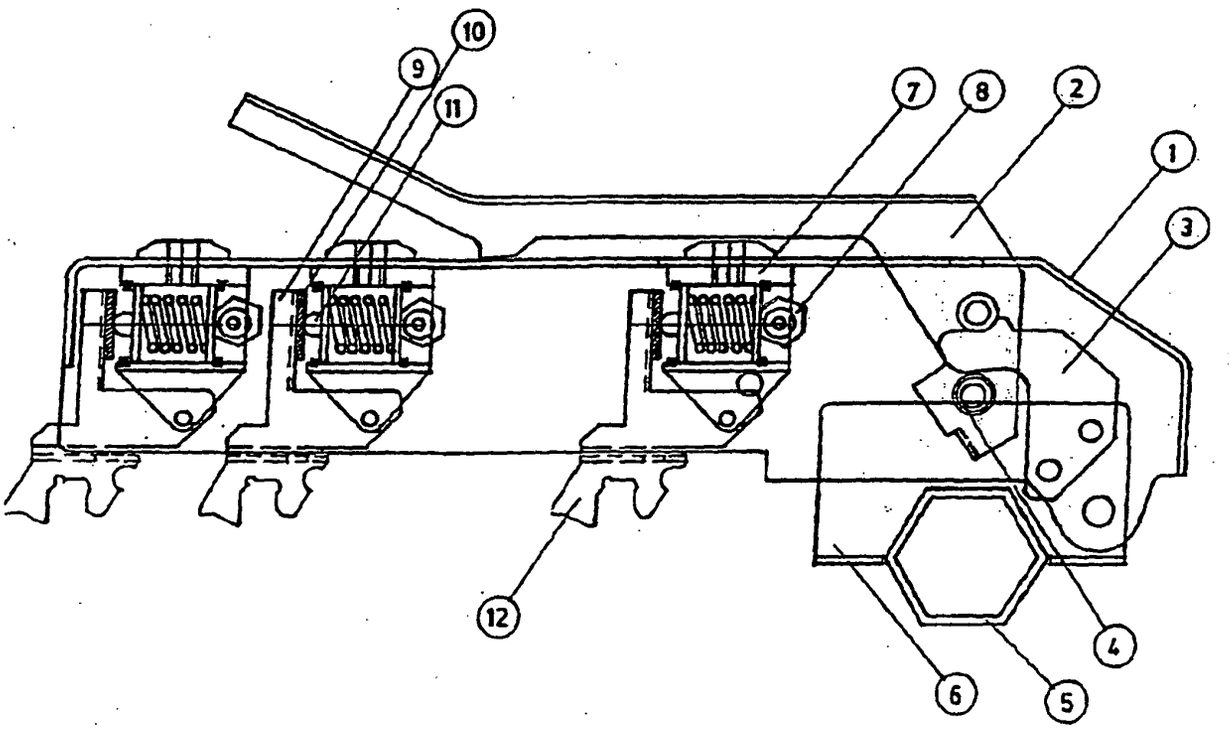


FIG - 7

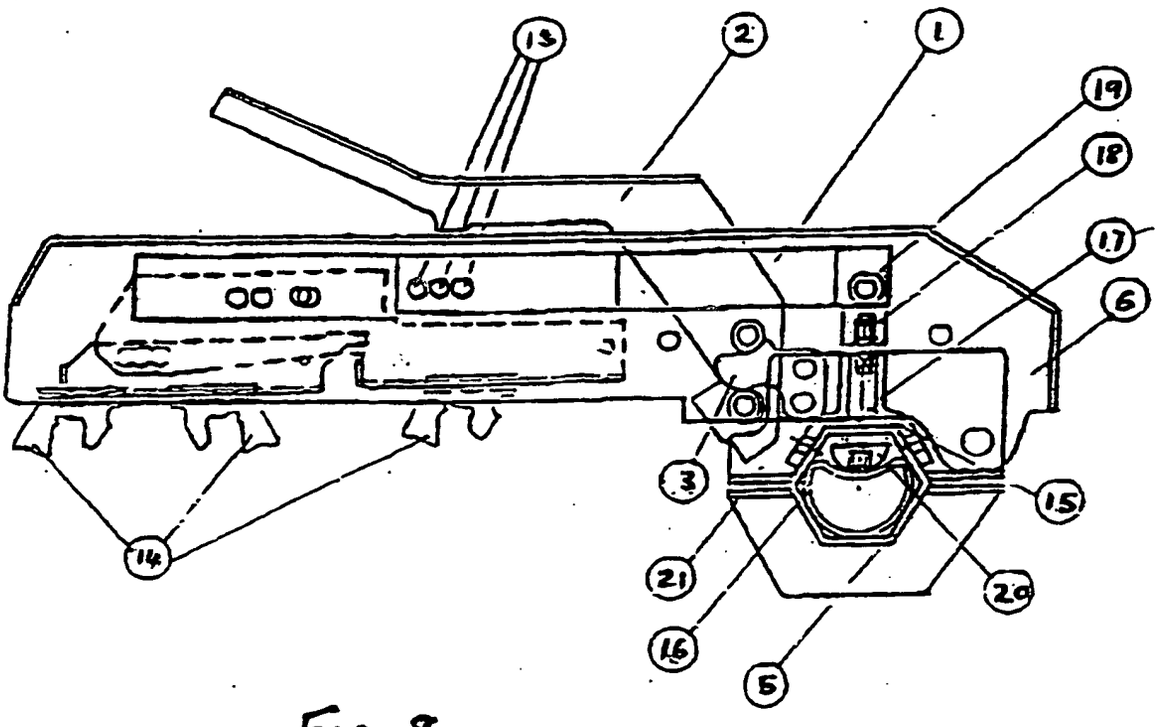


FIG 8

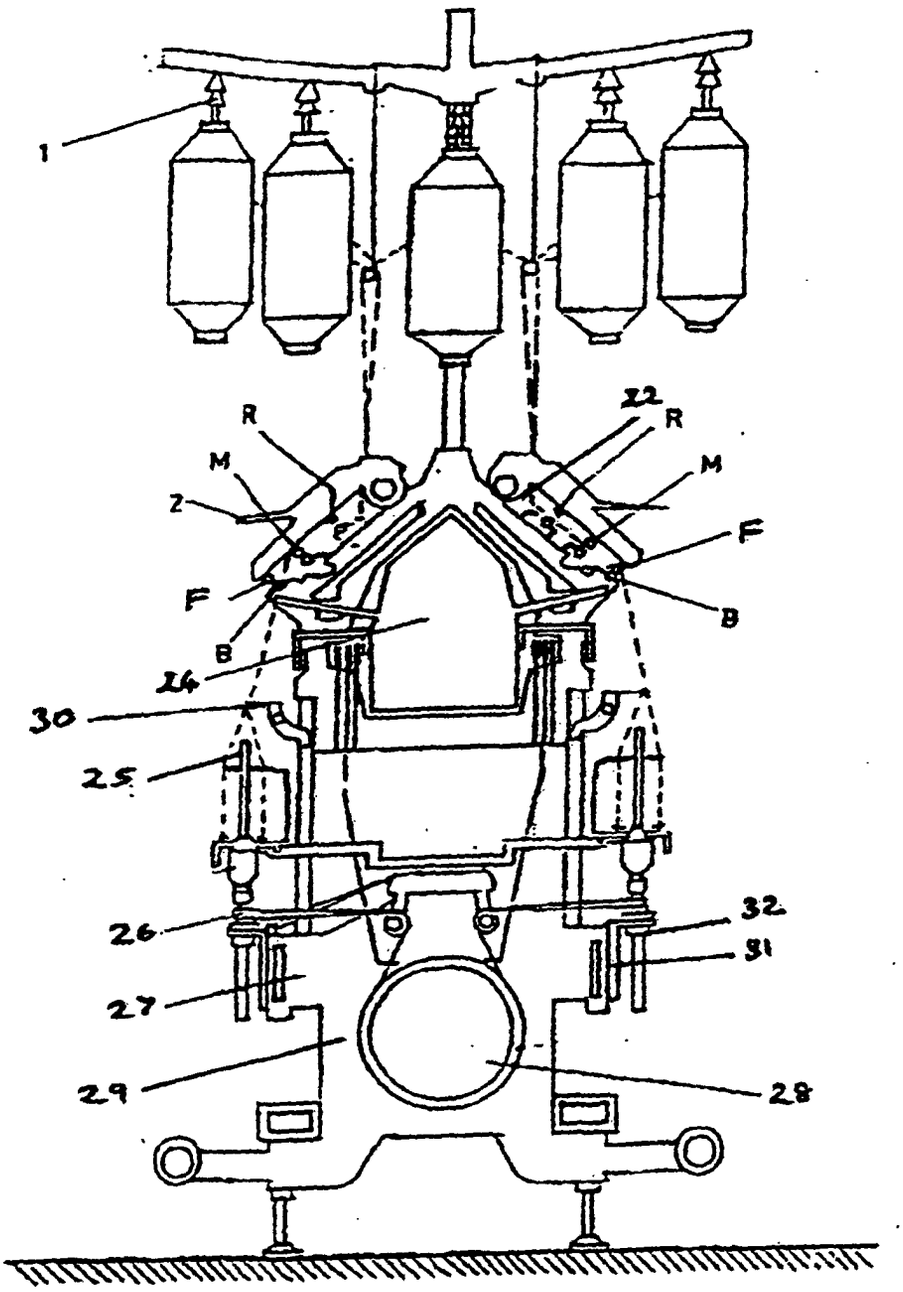


FIG 9

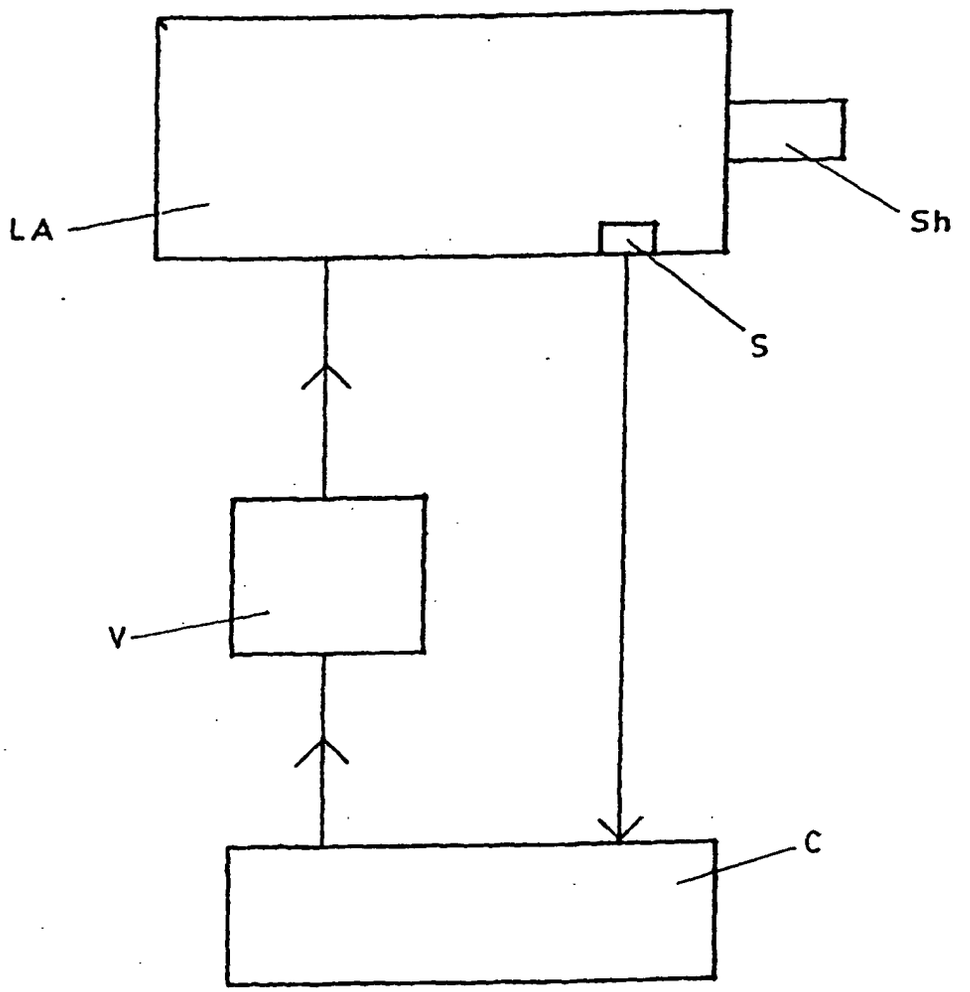


FIG - 10