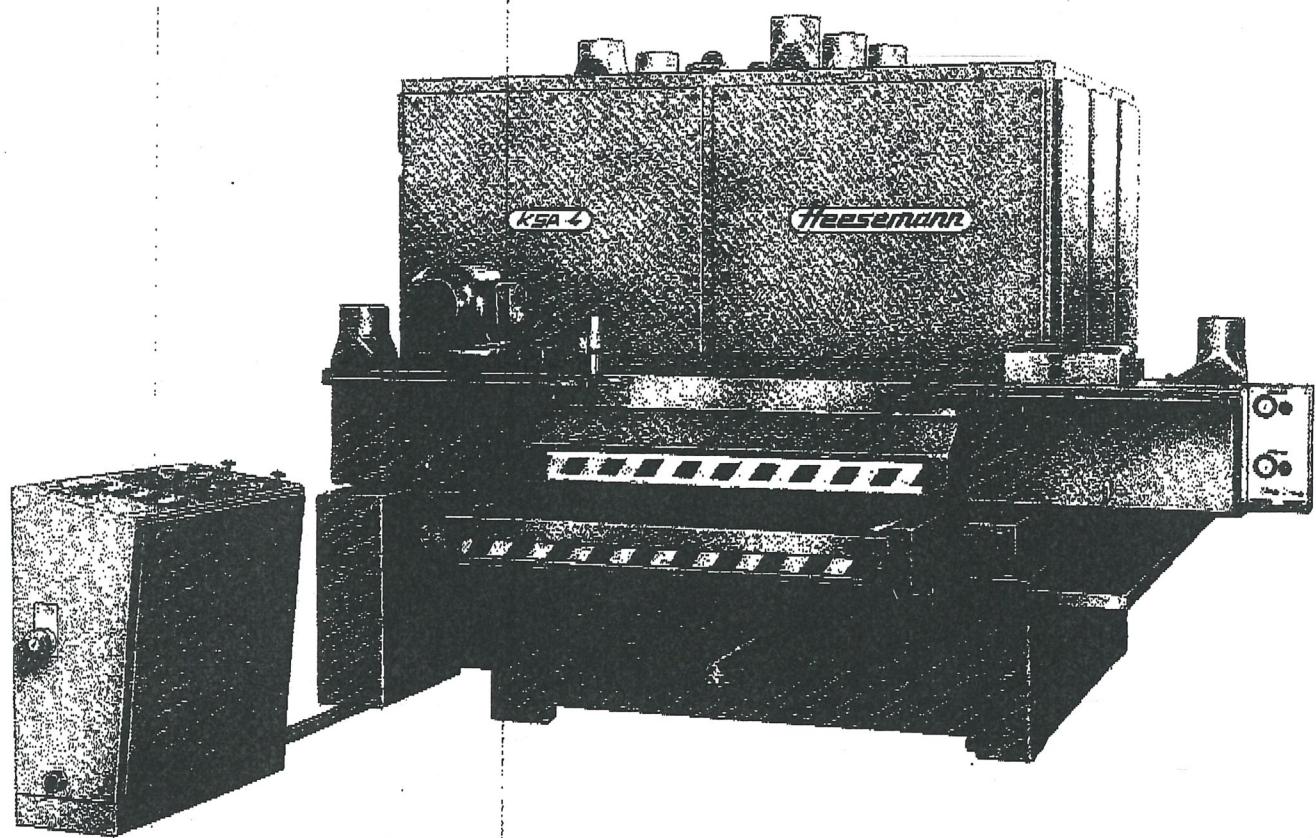


heesemann



Kreuzschleif-Automat Type KSA 4

S. 1-2 Baujahr 1981
S. 3-13 Baujahr ca 1985

In konsequenter Weiterführung der bisher schon nach dem Baukastenprinzip gebauten Kreuzschleifautomaten können jetzt auch nachträglich die Quer- und Längsschleifaggregate untereinander ausgetauscht werden. Die spätere Veränderung der Reihenfolge der Schleifaggregate kann sich als vorteilhaft erweisen, wenn im Zuge eines Modellwechsels in der Möbelindustrie der Arbeitsablauf für die Oberflächenbehandlung anderen Werkstückstrukturen angepaßt werden soll. Der Austausch der Aggregate kann jederzeit erfolgen ohne daß in der Erstausrüstung schon auf eine evtl. spätere Änderung in der Reihenfolge der Schleifaggregate Rücksicht genommen werden müßte. Damit ist dem Problem vorgebeugt, daß der Betreiber der Maschine später vor der Schwierigkeit steht, eine Bestückung des Kreuzschleifautomaten gewählt zu haben, die nun nicht mehr der Anforderung entspricht. Eine Anpassung des Kreuzschleifautomaten KSA 4 an den bestgeeigneten Schleifablauf ist jederzeit ohne umfangreiche Umbauarbeiten möglich.

Oftmals genügt im Augenblick der Kaufentscheidung eine bestimmte Anzahl und Anordnung der Schleifaggregate, um den gewünschten Schiefeffekt zu erzielen. Es fragt sich dann oft, ob für zukünftige Schleifaufgaben nicht doch ein weiteres Aggregat erforderlich wäre. Eine Erweiterung des Kreuzschleifautomaten um ein zusätzliches Quer- oder Längsschleifaggregat ist späterhin durchführbar, sofern das Transportbett die erforderliche Länge hat; sonstige Anpassungsarbeiten sind aber in der Erstausrüstung nicht notwendig.

Das umfassende Baukastensystem der KSA 4 bietet die Gevißheit, einen Schleifautomaten zur Verfügung zu haben, der sich nicht nur in der Erstausrüstung sondern auch später durch Änderung der Aggregatfolge auf die Produktionsbedingungen einstellen läßt.

In der Grundausführung ist die Maschine KSA 4 für zweigleisige Beschickung eingerichtet. Die Werkstücke werden auf der linken und rechten Maschinenseite jeweils an einem Anschlaglineal geführt. Die wirksame Andruckfläche wird über Klippschalter am Schaltachrank von der linken und rechten Maschinenseite aus entsprechend der Werkstückabmessung eingestellt. Durch Erhöhung oder Reduzierung der Schaltstufen über die äußere seitliche Werkstückkante hinweg kann die Schleifintensität im seitlichen Kantenbereich bestimmt werden. Durch die zweigleisige Belegung des Transportbettes wird eine hohe Ausnutzung der breiten Schleifbänder erreicht. Für großflächige Teile steht die gesamte Nutzbreite der Maschine zur Verfügung.

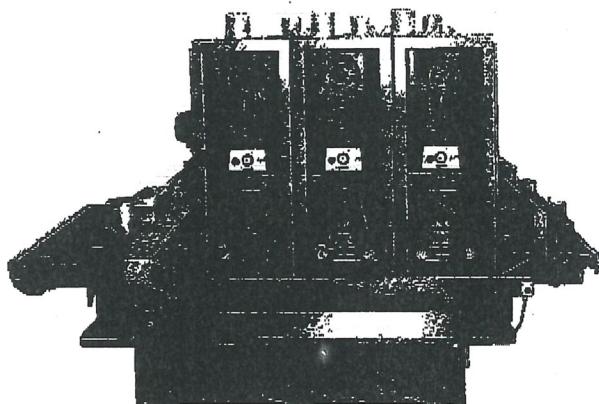
Der rasche Fortschritt auf dem Gebiet der Elektronik kommt dem Bedienungskomfort und den Einstellmöglichkeiten der Maschine zugute. Nur noch eine Reihe von Kontaktrollen, die vor dem ersten Schleifaggregat angeordnet ist, überträgt die Impulse, die durch das durchlaufende Werkstück ausgelöst werden, auch auf die weiteren Schleifaggregate. Dadurch wird der Werkstückabstand auf ein minimales Maß verringert. Die individuelle Einstellung der einzelnen Schleifaggregate bleibt aber trotzdem erhalten. Wesentlich ist die Regulierung der Schleifintensität im Kantenbereich. In bezug auf die seitlichen Kanten erfolgt die Beisaltung von 0 - 3 Steuerzylindern über die Werkstückkanten hinaus. Dadurch verläuft die Kurve der gesteuerten Andruckfläche des Druckbalkens bei der seitlichen Abhebung steiler oder flacher. Der Einsatzpunkt der wirksamen Andruckfläche ist unabhängig von der Vorschubgeschwindigkeit in der elektronischen Steuerung so programmiert, daß eine angemessene Schleifwirkung im Bereich der vorderen und hinteren Werkstückkante erzielt wird. Je nach Beschaffenheit der Werkstücke kann der Zeitpunkt für Schleifbeginn und Schleifende in einfacher Weise nach einer Skala vor oder zurück verlegt werden. Diese Einstellmöglichkeiten bestehen für sämtliche Schleifaggregate separat, und die entsprechenden Werte sind reproduzierbar. Eine veränderte Vorschubgeschwindigkeit oder andere Druckver-

hältnisse machen kein Nechstellen der Druckbalkensteuerung erforderlich.

Die Funktion der elektronischen Steuerelemente kann über Leuchtdioden verfolgt werden. Alle Bereiche des Elektroniksystems sind übersichtlich gegliedert, so daß eine leichte und schnelle Kontrolle möglich ist.

Der elektronischen Steuerung kann ein Rahmenprogramm angegliedert werden, nach dem die Arbeitsweise der verschiedenen Schleifaggregate automatisch so reguliert wird, daß in jedem Bereich des Rahmens in der letzten Stufe immer ein Schliff in Faserrichtung erfolgt, dadurch wird ein gleichmäßiges Schleifbild auf den längs- und querfurnierten Elementen des Rahmens erreicht.

Wenn das Schleifgut Toleranzen von einem Werkstück zum anderen aufweist, was häufig in der Türproduktion vorkommt, kann die Maschine so eingerichtet werden, daß ein Ausgleich der Dickeintoleranzen an jedem einzelnen Schleifaggregat im Bereich bis zu $+/- 2$ mm automatisch erfolgt. Es wird also ein großer Abstand zwischen den durchlaufenden Werkstücken vermieden.



KSA 4 mit 1 Querschleifaggregat, 3 Längsschleifaggregaten und Bürstenwalzen.

Für leichte Kalibrierarbeiten kann die erste Umlenkwalze am Längsschleifaggregat so eingestellt werden, daß mit dieser Stahlwalze ein Planeschleifen z. B. an Rahmenenteilen, ausgeführt wird. Der flächige Druckbalken dieses Schleifaggregates kommt ebenfalls zum Einsatz. Die Verwendung der Umlenkwalze zur Werkstückbearbeitung wird dadurch ermöglicht, daß der Schleifbandbetrieb an den Längsschleifaggregaten grundsätzlich oben liegt und nicht im Bereich der Andruckelemente. Der oberliegende Schleifbandantrieb bewirkt konstante Verhältnisse in der Eingriffszone des Schleifbandes auch bei unterschiedlicher Belastung.

An der Auslaufseite des Kreuzschleifautomaten kann eine Entstaubungsanlage installiert werden, um beide Seiten und die umlaufenden Kanten der Werkstücke vom anhaftenden Schleifstaub zu säubern. Diese Einrichtung ist mit dem Transport der Maschine verbunden und wird zentral mit den Schleifaggregaten in der Höhe eingestellt.

Der von unten arbeitende Kreuzschleifautomat KSA 2-U wird ebenfalls mit der elektrischen Schaltung für die wirksame Andruckfläche der Druckbalken oder mit der erweiterten elektronischen Druckbalkensteuerung ausgerüstet.

In Sonderfällen kann der Kreuzschleifautomat in größerer Arbeitsbreite als 1.350 mm gebaut werden.

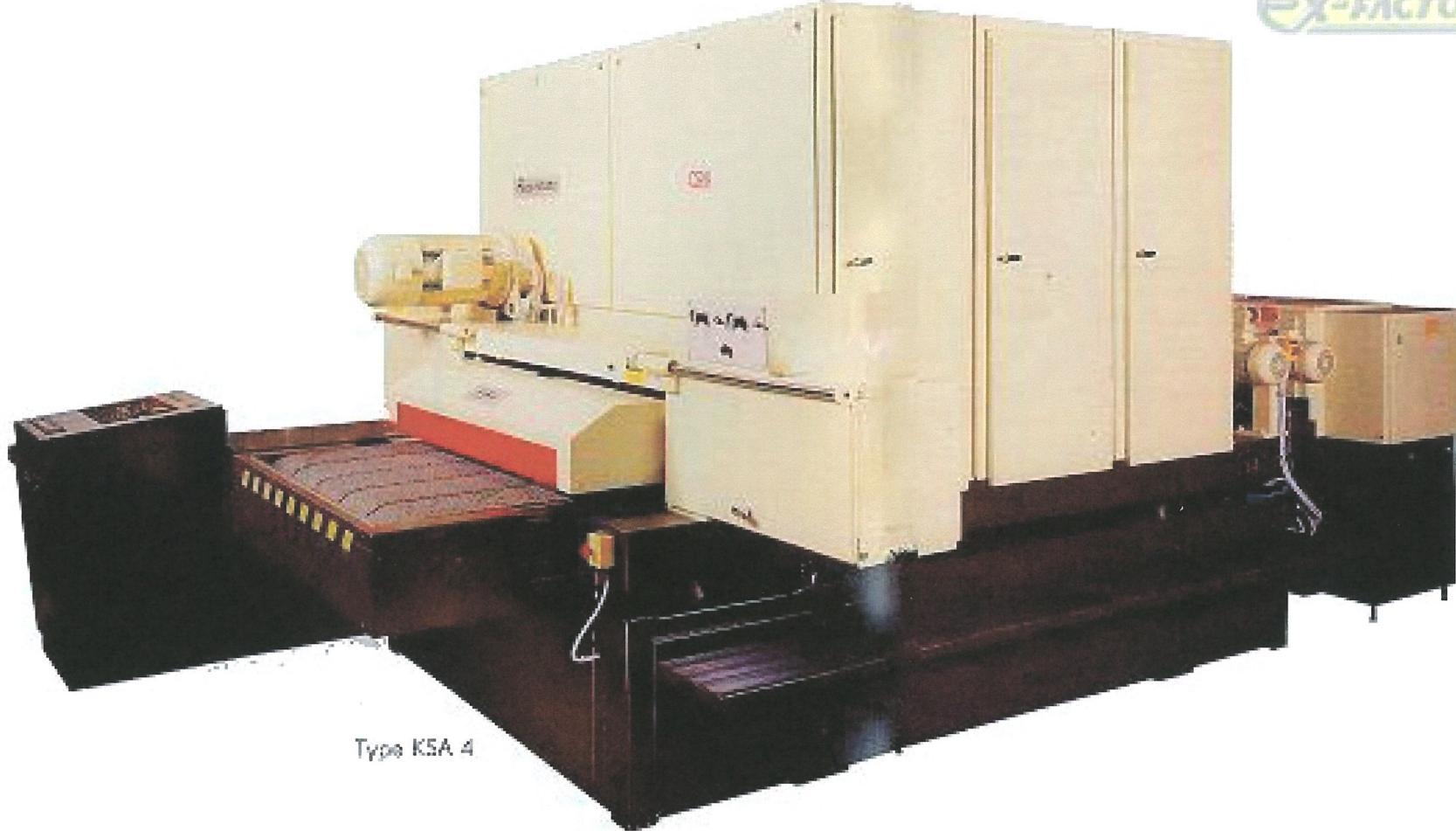
Die technischen Daten im Prospekt KSA 2-B sind im übrigen auch für das jetzige Modell KSA 4 gültig.

Änderungen vorbehalten 0581

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EX-FACTORY

Type KSA 4

Automatic Cross Sander

Type KSA 4

FACTORY

Design features at a glance

As compared with conventional designs, the KSA 4 model offers important advantages:

- High capacity cross sanding with one machine
- Modular build-up with several cross and longitudinal sanding units, also facilitating future additions of units and arrangement changes
- Excellent finish at high sanding performance; the large controlled oscillation range of the wide sanding belts ensures sanding path overlap and prevents ridges
- Large-area sanding across and with the grain
- Free and multi-track infeed by means of automated electronic pressure bar control
- Automatic compensation of thickness variations up to at least 2 mm
- Electronic workpiece sensing enables sanding of irregular shapes, such as round and oval table tops
- Integrated frame sanding program for sanding cross and longitudinal friezes with the grain
- Determination and control of the sanding intensity over the edge area, also asymmetrically
- Adaptation to the workpiece material thanks to different belt speeds, also infinitely variable
- High user comfort through optical monitor displays
- Automatic machine run-up with retention of previously set operating data
- Integrated computer system enables storage and recall of setting data
- Over 50% energy saving through optimised dust extraction and compressed air utilization
- NEW
Infinitely variable sanding pressure regulation using the CSD sanding system

Cross sanding method



It is well known in the wood-working industry that cross sanding provides the best surface finish. We took this into account many years ago when we set up two double-belt sanding machines for cross and longitudinal sanding.

This arrangement of sanding machines soon became popular with the furniture industry and led to our well-known KSA range, which provides cross sanding using the same machine.

A first sanding pass across and a second pass with the grain is the way to achieve a superior surface quality. The cross sanding operation eliminates much of the raised grain, which will no longer re-appear during the staining and lacquering stages.

Cross sanding is also more effective in eliminating jointing paper which usually follows the grain. Especially when sanding wood with annual rings of different hardness, cross sanding leads to a vast improvement in surface finish.

The inevitable sanding marks produced will be eliminated by the action of the wide sanding belts in subsequent operations. This means that the cross sanding method produces a regular surface structure, ready for the application of stain or lacquer, at the same time reducing the amount of lacquer needed. The result is high quality combined with economy.

The sanding belt grade to be used for the longitudinal sanding passes depends on the type of wood and the required finish.

Machine concept

The implementation of up-to-date technology with our KSA 4 model guarantees effective continuous production to highest quality standards. Since the automatic cross sander is frequently positioned at the infeed end of the finishing line, to enable the automation of the wood and veneer sanding operations, as well as the application of lacquer, on the same process line, different conditions apply to the preparatory wood sanding operation, and the process sequence will depend on the required structure and surface finish of the workpieces. The cross sanding process must be flexible.

Flexible set-up

EX-FACTORY

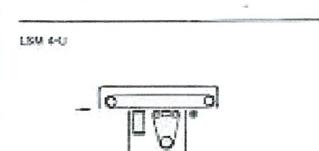
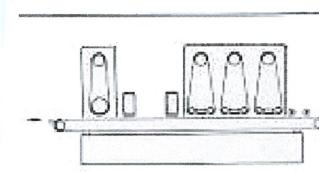
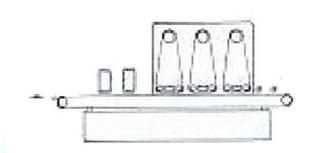
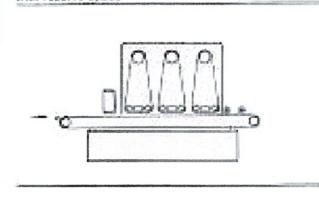
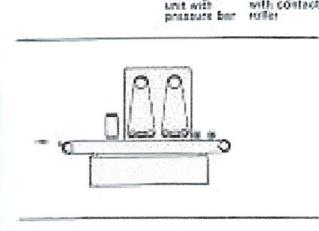
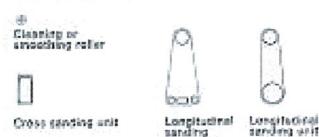
The Heesemann modular system

The main units making up the automatic cross sanding machine are designed in such a way that various longitudinal and cross sanding units may be used in different combinations by consequent modular construction to suit individual requirements. The transport bed will accept up to 6 successive sanding units, arranged in accordance with the particular process requirements. The abrasive grain used may be adapted to each operation, from coarse pre-sanding to fine finish sanding, depending on the required surface finish. Furthermore, the cross and longitudinal sanding units may be arranged in such a way as to permit longitudinal sanding even for cross veneered workpieces in the final process phase.

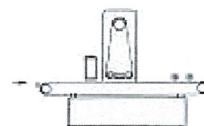
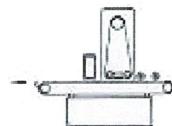
Cross and longitudinal sanding units may be interchanged at any time

Changing the sequence of the sanding units may become necessary at a later date, when different workpieces have to be processed as a result of constitutional changes of furniture design. This re-arrangement of units is possible at any time and there is no need to plan for this eventuality when determining the equipment for the first time. This eliminates any problems the user may face at some stage, when he finds that the equipment of his automatic cross sanding line no longer suits his needs. The KSA 4 can always be adapted to give the best results, without the need for complex change-over operations.

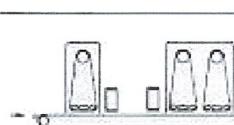
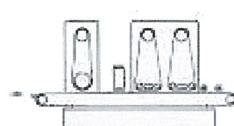
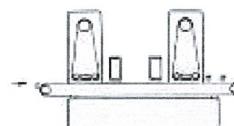
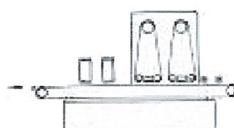
Explanation of symbols:



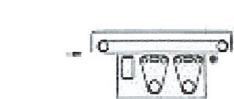
KSA 4



with reserve space



LSM 4-U



Some possible unit arrangements

Additional equipment at a later date

Apart from the fact that the transport bed must be of sufficient length to accept the units, an additional unit can be fitted fast and without complications.

The comprehensive modular system particular to the KSA 4 model provides the guarantee that the sequence of the units making up the line may always suit all production requirements, not only by the original equipment of the machine but also through the possibility of later adaptation. Some arrangement examples are shown in the graphic representation.

The transport bed

The working width is 1300 mm, if necessary also 1600, 1800 and 2100 mm.

The transport bed is equipped with a series of narrow transport belts, or with a wide transport mat on request, which continuously advance the workpieces below the sanding units.

The feed speed is infinitely variable between 6 and 30 m/min, by means of a V-belt transmission. A digital indicator is optional. For extremely high production requirements, the feed speed may be increased to 40 m/min or as needed for a particular application. The pressure rollers before and after each sanding unit keep the workpieces firmly in place. The transport bed working height is always 920 mm. Depending on workpiece thickness, from very thin panels up to 80 mm or even more, the entire superstructure is height-adjustable, and a digital indicator displays the value set.

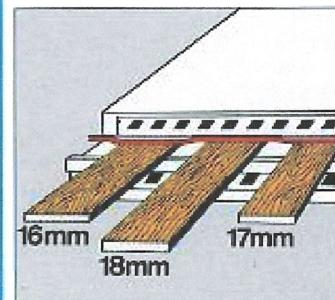
Slip-free workpiece transport

Unless only large-area workpieces, such as door panels, are processed, it is advisable to equip the machine with an intensive suction clamping device, to make sure that the workpieces are always securely held in place. High power suction fans in conjunction with suitable channels in the transport table keep the workpieces in firm contact with the transport belts, to prevent the workpieces from slipping and getting damaged. The suction intensity is automatically adjusted to the size of the workpieces, large or small. A reversing belt blasting device below the transport bed keeps the transport belts dust free during operation, maintaining suction efficiency at all times. A dust-free belt means no workpiece slip.

Tolerance compensation up to 2 mm plus

Ex-Factory

The sanding process is performed by use of elastic large-area pressure bars, which are of similar design both in cross and longitudinal sanding units. The pressure bar system which we have developed ensures thickness difference compensation up to 2 mm and even more. The thickness variations may occur within the same workpiece, or may manifest themselves from one workpiece to another. These differences are automatically compensated for by the pressure bar, without need for further auxiliary equipment. Especially when sanding thin veneers or surfaces with a thin lacquer coating, the fact that the pressure bars will compensate for tolerances of at least 2 mm is highly essential for preventing from any risk of sanding through the surface, even in the edge area. In addition, there is no longer any need for extreme precision when adjusting the height setting exactly to the workpiece thickness. This reduces setting-up times and increases comfort and sureness of operation.



Wide-range tolerance compensation

Representation of quality and performance

Unit design

A basic prerequisite for achieving a perfect sanding finish is the ability of the wide pressure bars to exert an absolutely even sanding pressure over every individual area of the workpiece, and that the overall sanding pressure can be adapted to the process requirements. This applies both to cross and longitudinal sanding. A driven lamella belt in the cross sanding unit, running at a lower speed but in the same direction as the sanding belt, is largely responsible for maintaining an even sanding pressure. By using the most suitable lamella belt, the specific pressure can be adjusted to individual process requirements.

The wide sanding belt of the longitudinal sanding unit follows a reciprocating motion across the direction of feed over the entire sanding path, and the amplitude of this transverse oscillation is adjustable as a function of the effective working width. This reversing movement across the sanding path width prevents the formation of sanding marks by overlapping and produces a superior surface finish. In addition, the full width of the sanding belt is utilized. A self-cleaning infra-red sensing and control device maintains the

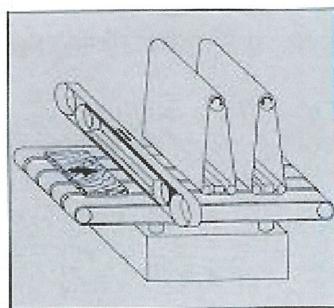
central position of the wide sanding belt, which mostly runs against the direction of feed, or with the feed in special cases.

The high performance of this automatic cross sanding machine is further enhanced by the use of 3250 mm long sanding belts. Any irregularities in the length of the belt edges that may be present as a result of manufacture, will be automatically compensated for, thanks to the special suspension arrangement of the upper driving roller. This ensures universal use of sanding belts.

Oscillating belt blasting units effect continuous dust removal from both the cross running and from the wide longitudinal belts during operation. Due to the intermittent working mode of the belt blasting units, in step with the workpiece throughput, considerable savings in compressed air consumption are achieved. To facilitate quick belt changing and to maintain constant compensation for extension, the sanding belts as well as the lamella belt are tensioned pneumatically.

The versatility of the machine, with its ease of adaptation to

varying surface conditions is also due to the sanding belt speed selection available: 8, 12, 16 and 24 m/s. For universal wood and lacquer sanding, additional lower speeds may be selected. Infinitely variable speed regulation over a wide range of 1.2 to 20 m/s is possible by means of electronic frequency converters. During the sanding process only the effective area of the pressure bar, corresponding to the width of the workpiece passing through, is brought into sanding contact. The touch down and retract motion of the various pressure elements operates individually with respect to each workpiece being sanded which triggers the pressure bar action automatically by an electronic sensing and control system. The timing for the pressure bar to make contact with the workpiece adjusts automatically to the feed speed and is constant in relation to the workpiece.



1 cross sanding unit
2 longitudinal sanding units

Sanding system

With modern, efficient production lines, the facility for free and multi-track infeed is expected as a matter of course. This implies the need for electronic control of the units within the process line. The workpieces are sensed by a series of contact rollers, and these trigger the touch down movement of the pressure bar sections. There is no longer any need for adjustment of the sanding width. This system, whereby the process functions are controlled by the workpiece itself, has been developed by us and for which domestic and foreign patents have been granted us. The contact sensing rollers, spaced at 40 mm intervals, are present only at the infeed end of the first unit, and the control pulses generated are then passed on to the following sanding units. This reduces the distance between workpieces to

a minimum, whilst retaining the individual setting values of each unit. Of course, every unit can also be switched and controlled separately and differently according to working requirement.

Regulation of the sanding intensity

Sanding intensity regulation is particularly important over the edge area. For longitudinal edges the effective pressure bar area is controlled in such a way that the sanding intensity is sufficient for a perfect surface finish, whilst avoiding the danger of sanding through. This also applies to veneered workpieces with curved contours and frames. Different sanding intensities may be set at the control panel for the left and right hand workpiece edges. This asymmetrical sanding method is particularly suitable for panels with solid tipping projecting on one side. With free

workpiece infeed the tipping is sanded at increased pressure, and the opposite veneered edge is sanded smoothly.

The touch down and retract timing for the effective pressure bar elements may be advanced or retarded, depending on the workpiece conditions. The change of feed speeds or pressure conditions does not require any re-adjustment of the pressure bar control. Since the effective pressure area of the pressure bars adapts automatically to the position, shape and size of the workpiece, several workpieces of equal thickness may be fed in side by side, slightly spaced, and at irregular intervals one after the other. This makes the KSA 4 machine eminently suitable for use at the infeed end of finishing lines. It is also possible to sand workpieces of irregular shape, such as round table tops, panels with curved contours, etc., as well as frame components.

The joint effect of extensive tolerance compensation up to at least 2 mm thickness difference by the pressure bars, and the controlled sanding intensity guarantee high adaptability and a superior surface finish.

Versatility in every detail

An integrated frame sanding program automatically controls the operation of the different sanding units in such a way that the last pass over all parts of the frame is always with the grain. This ensures a uniform finish of both the length and cross veneered frame members. Similarly, surfaces consisting of length and cross veneer will be finish sanded with the grain in all areas.

For sizing before fine sanding a longitudinal sanding unit with a large-diameter (350 mm) contact roller may be used. The type of sizing work determines the drive power and the hardness of the roller lining.

For light sizing work the guide roller of the longitudinal sanding unit may be adjusted so that this steel roller acts as a plane sander on workpieces such as frame components. The large-area pressure bar of the unit will also be in use.


The use of the guide roller for workpiece processing is feasible because the belt drive of the longitudinal sanding units is always from above and never in the area of the pressure elements. The top drive arrangement ensures constant conditions in the area of sanding action, even under different loads.

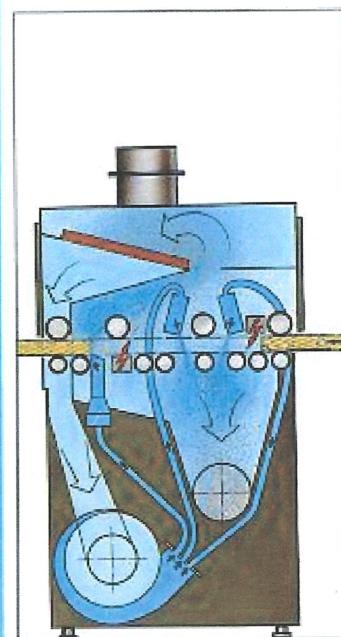
Brushing unit

A brush unit at the outfeed end of the machine removes any remaining dust traces from the workpieces. The individually driven brush roller is height adjustable and provided with an extractor hood.

To complement the belt sanding units a follow-up smoothing roller with special sanding material may be used, either to achieve a smoother surface or to provide special effects (rustic) during subsequent surface treatment operations. In the case of cross veneered workpieces brush belts with an abrasive lining may be used.

Dust removal

Where the automatic cross sanding unit is located at the infeed end of a finishing line, it is requisite to clean all remaining dust particles from the surfaces and the edges before the lacquer is applied. To this effect a model EA 2 dust removing device is installed at the outfeed end of the machine. This unit uses a high powered blower and a re-circulating air system and may in addition be fitted with an ioniser to eliminate any electrostatic charges. The unit is linked to the machine transport system, and is centrally height adjustable, together with the sanding units.



Dust removing system

Controls



All the controls of the machine are grouped together in one central control panel and clearly referenced to the individual units. LEDs provide an indication of the controlled process sequence. The entire process is continually monitored for drive or control faults, and any malfunction is source-traced and optically indicated. All sections of the electronic control system are clearly grouped to facilitate easy and fast system checks. The electrical wiring allows for interlinking with other machines in a production line.

The automatic run-up facility, together with the fact that all set data still remain stored, ensures that full operating capacity is available immediately after switching on again after an interruption.

Operating safety and operator protection are assured as the entire machine switches off immediately in the event of belt tear or run-off, or compressed air failure. Other safety features include wear-free electronic counter-current brakes for the drive motors, an equalizing reservoir for short-term compressed air supply and stabilisation, as well as optional explosion proof design if the unit is operated in the lacquering area.

Optional workpiece gauging is provided by means of an external automatic thickness setting facility. The operating side, as regards the control panel location and for longitudinal sanding belt replacement, may be at either side of the machine, depending on local conditions and preferences.

Intelligent sanding technology.

CNC technique

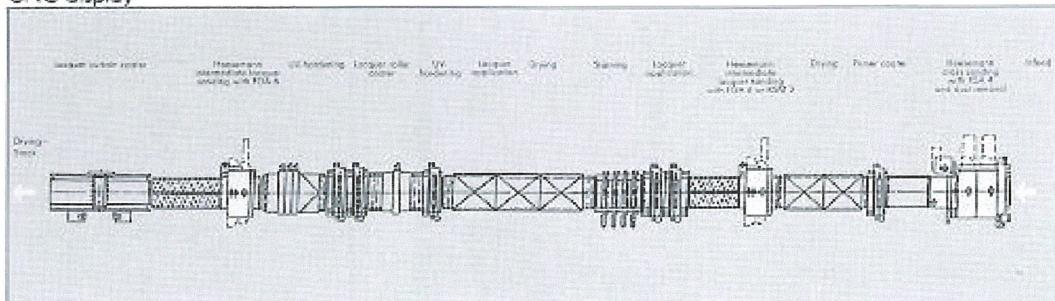
In furniture production increasing emphasis is placed on fast machine adjustment to small batch runs, which require different setting values each time. The resetting times must be as short as possible to guarantee continued production without long interruptions. We have developed an integrated computer system for the KSA 4 model which permits the storage of setting data and their recall by program numbers at any time. The individual programs contain the setting values for the sanding belt drive motor speed, feed speed, timing of pressure bar application (sanding start and end), sanding intensity over the edge area, as well as for the sanding pressure. In addition, the computer prompts the operator with regard to height setting and grit grade. The setting values are

put in and monitored via display, which also traces and indicates possible faults in the electrical system. If some values require changing while the program is running, the program values may be modified accordingly without stopping the machine. Even new programming is possible while a program is running. The CNC design permits the integration of the KSA 4 into fully automatic on-line control of processing lines, and the KSA 4 computer can take over central control.

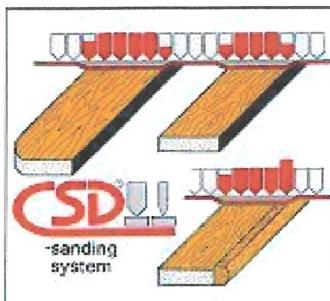
As an extension of the computer system the connection of an operating data acquisition system becomes possible, so that the sanding capacity can be continuously discerned in relation to the surface area sanded in square metres. Capacity data acquired in this manner provide important background information regarding the production process, belt change times and machine maintenance in general.



CNC display



Example of a finishing line



Infinitely variable pressure regulation



High-resolution workpiece sanding

The CSD sanding system

For many years we have been making use of electronics for the control of sanding processes and hence supported by a computer for improved machine operation. The increased activation of electronics paved the way to our new CSD sanding system, which retains all the proven design features of our automatic sanding machines. The sanding pressure determines the rate of stock removal throughout the sanding process, and the workpiece properties, above all over the edge area, determine the pressure to be used. The workpiece contours are detected with great precision by means of a high-resolution sensing system, and the data obtained are computer processed and fed directly to the individual pressure bar elements. The pressure exerted by the individual elements is infinitely variable by electrical means, and its force is selected on requirements. If the workpieces are veneered up to the edge, the pressure elements exert a correspondingly reduced pressure in this area. If certain workpieces, such as table tops with solid lippings, require heavier sanding passes at the edges, the pressure in this area will be increased accordingly. For veneered panels with a solid edge on one side only the sanding pressure applied will be asymmetric, exactly in line with workpiece requirements.

Due to the computer controlled selective pressure regulation (CSD) and the high tolerance of thickness differences, the KSA 4 offers an optimum in quality and reliability when sanding panels of differing shapes. The CSD sanding system is also protected by domestic and foreign patents.

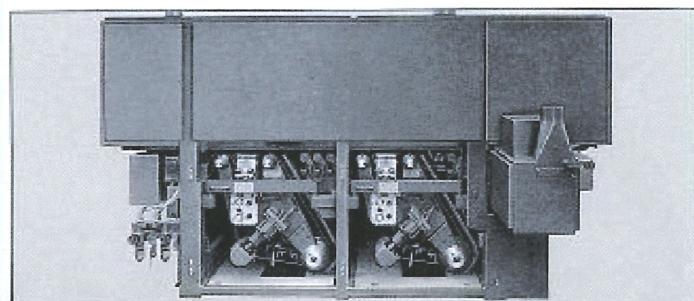
Energy utilisation

High performance with low expenditure for energy is no contradiction for the KSA 4 when it comes to dust removal and compressed air consumption. The dust is extracted from the immediate vicinity of the actual sanding area, that is to say where it is produced. The belt blasting device acts directly on the sanding belt guide roller, to achieve a very thorough cleaning effect. The special design of the dust channels leads to a considerable reduction of the air volume. The belt blasting system operates intermittently, and no compressed air is used when no workpieces pass through the machine.

LSM 4-U



For cross sanding both sides of a workpiece in one pass, the KSA 4 operates in combination with a LSM 4-U automatic machine which sands from below and is similar in design to the KSA 4. As the feed is precision regulated, both automatic machines may be positioned directly one after the other, without any need for intermediate transport. To improve access for operation, maintenance and workpiece checking, a driven transport track is however often arranged between the machines, one sanding from below and one from above. The LSM 4-U model is available for longitudinal and for combined cross sanding, according to the KSA 4 technical data.



Type LSM 4-U, sanding from below

Technical data	Main drive motors kW	Belt speed m/s	Sanding belts mm	Convollo pressure belts mm	Compressed air connection bar
Cross sanding units					
KSA 4					
Sanding width 1300 mm	13/17	12 + 24	7100 x 150	5450 x 140	8
LSM 4-U					
Sanding width 1300 mm	13/17	12 + 24	6200 x 150	5450 x 140	8
Longitudinal sanding units					
KSA 4					
Sanding width 1300 mm	16,5/21	8, 12, 16, 24	3250 x 1350		8
LSM 4-U					
Sanding width 1300 mm	13/17	10 + 20	2620 x 1350		8