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Møbelfabrik of Denmark

Brookman



WOODWORKING MACHINES WORLDWIDE

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DOVETAILERS

*Dovetailing a hallmark of fine furniture
Brookman the hallmark of fine dovetailers*

Brookman DOVETAILERS

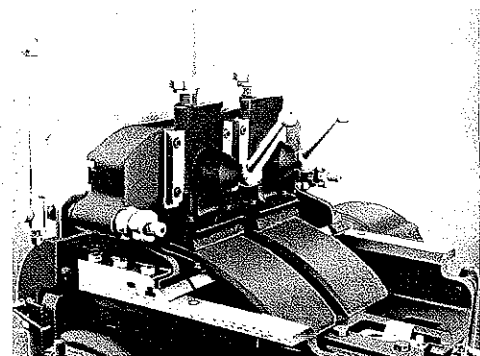
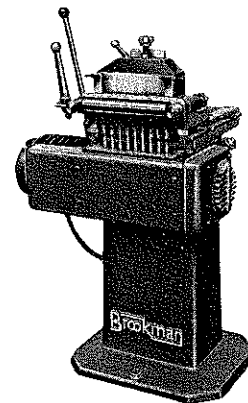
9 SPINDLE

HAND LEVER OPERATION

Cuts 1 ins pitch Furniture type dovetails upto 8 ins 203 mm wide. Maximum side thickness 1/2 ins 13 mm.*

MANUAL CLAMP MODEL 9 WMM

PNEUMATIC CLAMP MODEL 9 WPM



Convex curved fronts can be cut on 15 and 25 spindle dovetailers; concave on all models.

15 SPINDLE

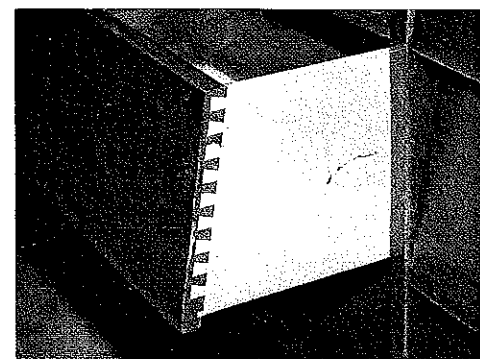
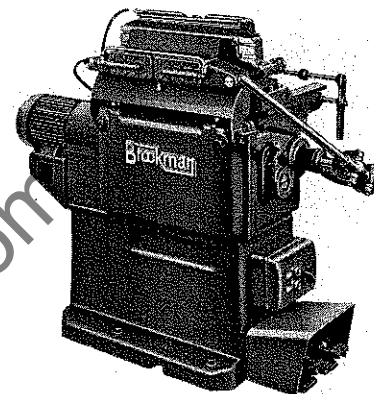
HAND LEVER OPERATION

Cuts 1 ins pitch Furniture type dovetails upto 14 ins 356 mm wide. Maximum side thickness 1 1/4 ins 32 mm.*

Can also be provided to cut 1/2 ins pitch Furniture dovetails; 1/2 ins or 1 ins pitch Taper Box dovetails and Corner Locking.

MANUAL CLAMP MODEL 15 RMM

PNEUMATIC CLAMP MODEL 15 RPM



Various pitch sizes can be cut on 15 and 25 spindle models. Above shows 1/2" pitch.

25 SPINDLE

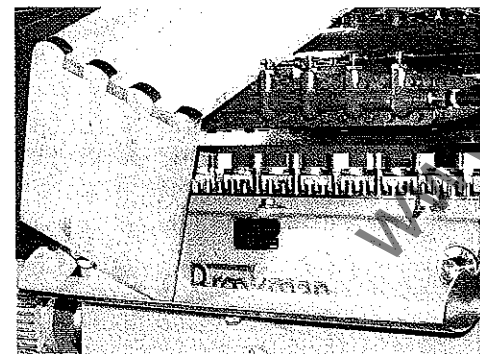
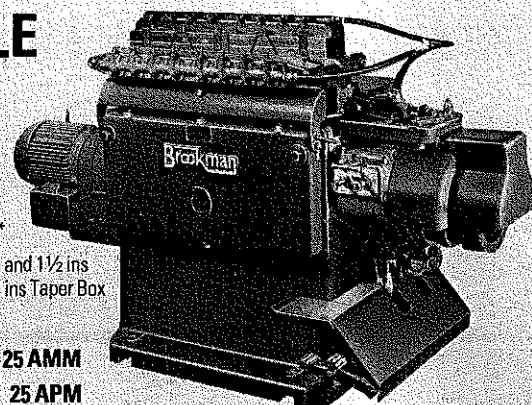
AUTOMATIC OPERATION

Cuts 1 ins pitch Furniture type dovetails upto 24 ins 610 mm wide. Maximum side thickness 1 1/4 ins 17 mm.*

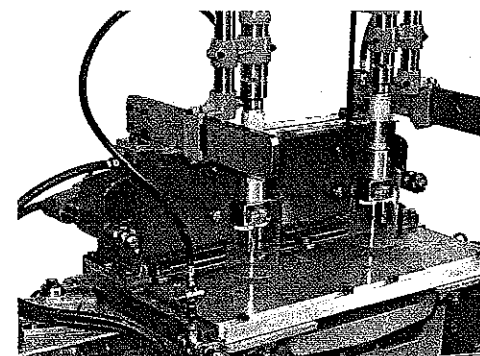
Can also be provided to cut 1/2, 3/4 and 1 1/2 ins Furniture dovetails; 1/2, 1 and 1 1/2 ins Taper Box dovetails and Corner Locking.

MANUAL CLAMP 25 AMM

PNEUMATIC CLAMP 25 APM



Box dovetails and Corner locking can be cut. Above shows box dovetails used for effect.



Drilling attachments, on the 25 spindle model, drill drawer fronts during the dovetailing.

* Side thickness implies the breadth fully dovetailed. Thicker sides are admitted but the extra thickness will be undercut.

Brookman multi-spindle Dovetailers are renowned throughout the world for the quality of the dovetails cut, for the high rates of production, and for their reliability.

Brookman dovetailers have a long pedigree extending back fifty years during which time the design has been consistently improved and updated. Brookman dovetailers were the first to mount the cutter spindles on ball bearings, to use an all gear drive, and to immerse the whole in a dust proof oil sump. All the developments since have been to the same high standard of innovation and sound engineering.

All types of dovetail joints can be cut and these in several pitch sizes. Smaller hand lever models are offered for low volume output, through to large capacity fully automatic types with pneumatic clamping and, if advantageous, drawer front drilling attachments.

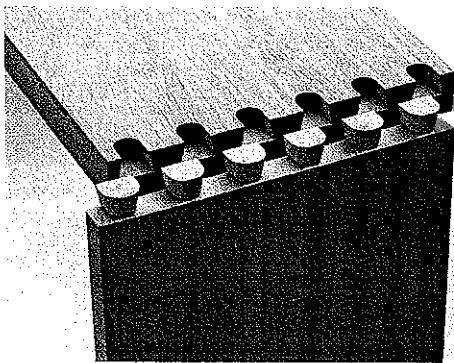
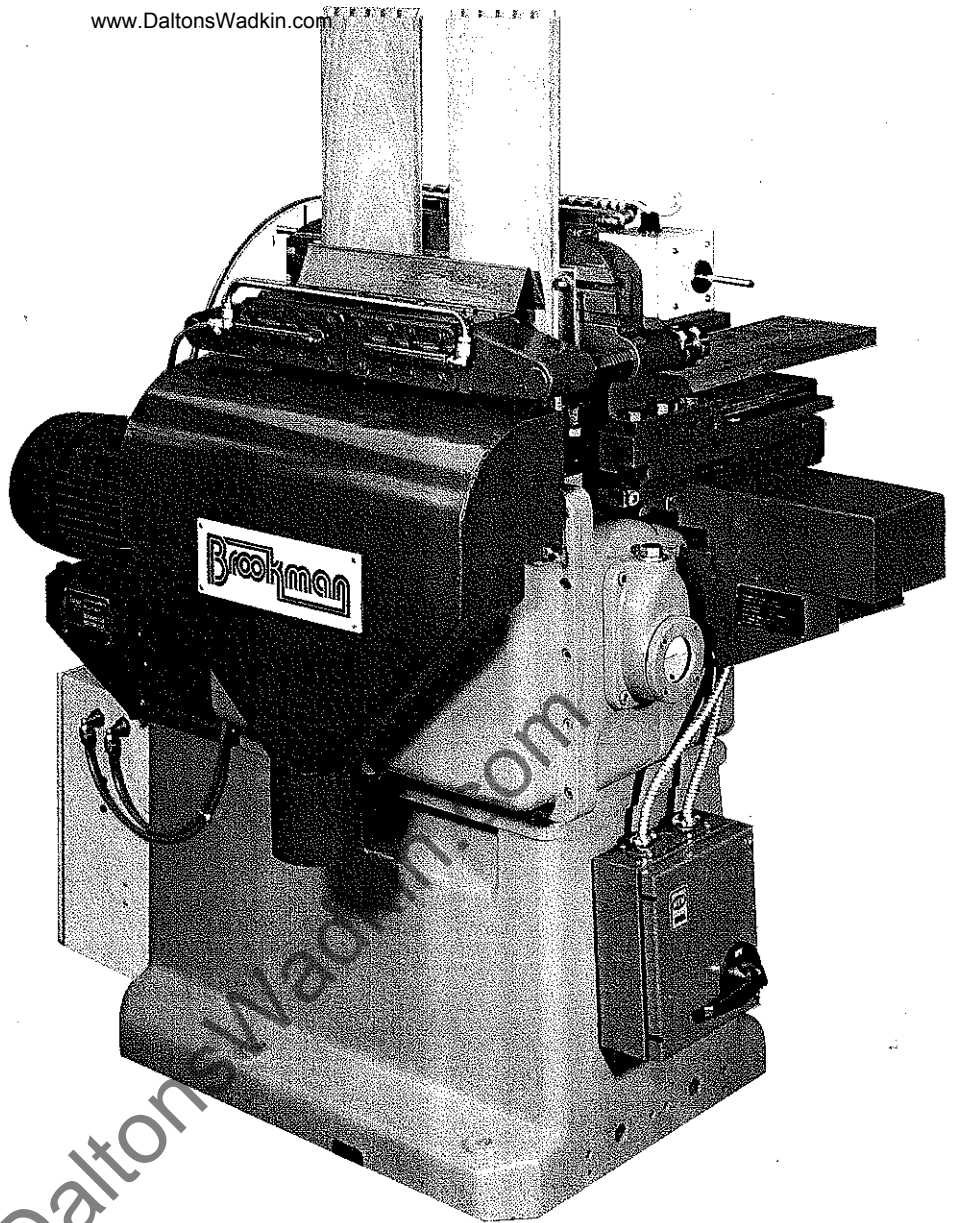
15 SPINDLE

AUTOMATIC OPERATION

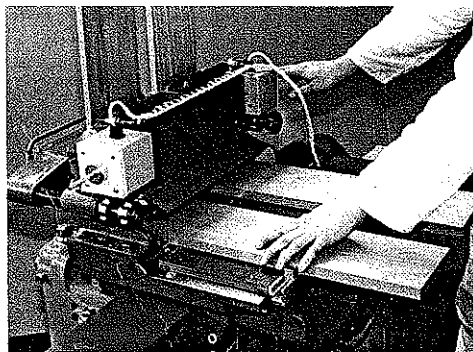
Cuts 1 ins pitch Furniture
type dovetails upto 14 ins
356 mm wide. Maximum
side thickness $\frac{3}{4}$ ins
19 mm.

PNEUMATIC CLAMP MODEL 15 RPA

The type RPA dovetailer has a completely new automatic operation with an up to the minute electro-pneumatic function. This imparts a smooth effortless movement to the work table ensuring accurately fitting dovetails of perfect quality. The simple touch trigger controls are conveniently sited. Clamp release is automatic. It is the ideal dovetailer for drawer production.



The dovetails are perfectly fitting, the pin accurately rounded to match the socket.



The newly designed automatic 15 spindle has touch trigger controls to clamps and feed.

All Brookman Dovetailers are of the multi-spindle type, with the cutters set at 1 ins 25.4 mm pitch. They cut furniture style dovetailing properly suited to general purpose drawer production.

All, excepting the 9 spindle models, have vertical adjustment to the cutter spindles enabling the dovetail pin length to be set exactly as required. Alternative cutters are available for larger variations in dovetail length. An adjustment within the machine enables the fit of the dovetails to be determined exactly as required and to compensate for cutter wear.

The 9 spindle hand lever and the 15 spindle automatic dovetailers, intended for drawer production, will cut only 1 ins pitch furniture dovetails. With additional equipment the 15 spindle hand lever and 25 spindle automatic models can be caused to cut several pitch sizes, and these also in taper box and corner locking styles.

Brookman
DOVETAILERS

SPECIFICATIONS

widths up to
f spindles
entres (pitch)
n width in cramps
n thickness in cramps
ft rpm
ndles rpm
wer
ett approx
ross packed for shipment
ox packed for shipment

www.DaltonsWadkin.com

9 SPINDLE MODELS

8 ins	203 mm
9	
1 ins	25.4 mm
8 ins	203 mm
1 ins	25.4 mm
50 hertz	2880
60 cycles	3500
50 hertz	9000
60 cycles	10500
3 hp	2.2 kW
625 lbs	283 kls
737 lbs	334 kls
22 x 31 x 35 ins	
584 x 787 x 889 mm	
14.4ft ³	0.48m ³

15 SPINDLE MODELS

14 ins	356 mm
15	
1 ins	25.4 mm
17 ins	435 mm
1 1/4 ins	35 mm
50 hertz	2880
60 cycles	3500
50 hertz	9000
60 cycles	10500
4 hp	3.0 kW
1113 lbs	505 kls
1484 lbs	674 kls
57 x 34 x 44 ins	
1448 x 864 x 1118 mm	
49.3ft ³	1.39m ³

25 SPINDLE MODELS

24 ins	610 mm
25	
1 ins	25.4 mm
26 ins	660 mm
1 1/4 ins	32 mm
50 hertz	1500
60 cycles	1800
50 hertz	6000
60 cycles	7200
5 hp	3.7 kW
2275 lbs	1034 kls
2640 lbs	1200 kls
74 x 38 x 44 ins	
1880 x 965 x 1118 mm	
72ft ³	2.03m ³

ailers have integral motor drive to suit 3 phase 50 or 60 hertz supply, motors are totally enclosed fan cooled, controlled by push button starters with overload and no volt full operating spanners and operator's manual (English) included.

ding clamps may be manually operated or pneumatic according to model. Pneumatic clamp models require connection to compressed air supply at 80/100 lbs psi 6.9 kg cm². tion is nominal. Electro-pneumatic model 15 RPA requires 2 cfm.

ailers are supplied, unless otherwise ordered, equipped to cut 1 ins 25.4 mm pitch Furniture type dovetails (ie the recognised general purpose style and size for drawer n). One set of HSS cutters is included. Adjustments within the machines enable Secret dovetails to be cut.

DETAILERS

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CLAMPS
Manual
Pneumatic
Manual
Pneumatic
Pneumatic

9 WMM
9 WPM

15 RMM
15 RPM

15 RPA

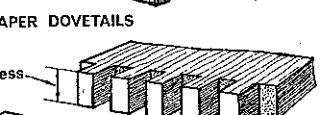
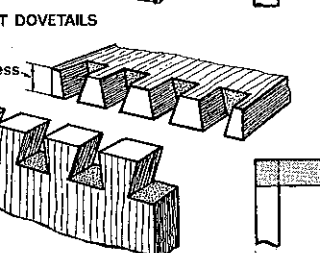
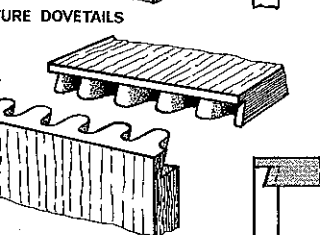
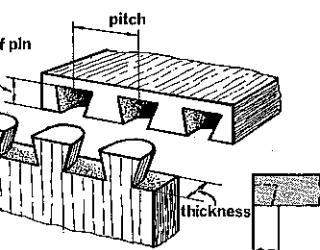
25 AMM
25 APM

25 APM(D)

with provision for drill attachments

CUTTER EQUIPMENTS

Each dovetailer requires a cutter equipment. Those for 1 ins pitch Furniture dovetails are integral with the dovetailer. Additional or alternative cutter equipments available for 15 spindle Hand lever models 15 RMM and 15 RPM, and for 25 spindle automatic models 25 AMM, 25 APM, and 25 APM(D) are listed below. Dovetail cutters are specified in List DC.



STYLE	PITCH SIZE
Furniture dovetails	1/2 ins 12.7 mm 3/4 ins 16.9 mm 1 1/2 ins 38.1 mm
Taper Box dovetails	1/2 ins 12.7 mm 1 ins 25.4 mm 1 1/2 ins 38.1 mm
Corner Locking	1/2 ins 12.7 mm 1 ins 25.4 mm 1 1/2 ins 38.1 mm

RFQ 1

APQ 1
APQ 2
APQ 4

RBQ 1
RBQ 2

APQ 7
APQ 8
APQ 9

RCQ 1
RCQ 2

APQ 18
APQ 19
APQ 20

DRILLING ATTACHMENTS

For use with pneumatic clamp model 25 APM(D)

One pair of attachments, comprising two mounting brackets each with one drilling unit.

Additional drilling units.

Additional brackets.

AXD 1
AXD 2
AXD 3

Compressed air consumption 9 cfm 250 lm per head, ie one pair AXD 1 consumes 18 cfm 500 lm whilst running.
www.DaltonsWadkin.com

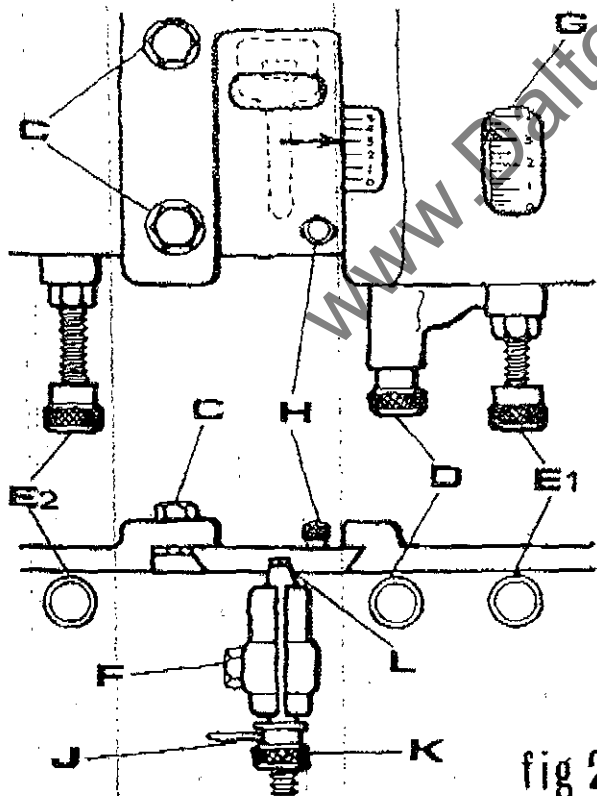
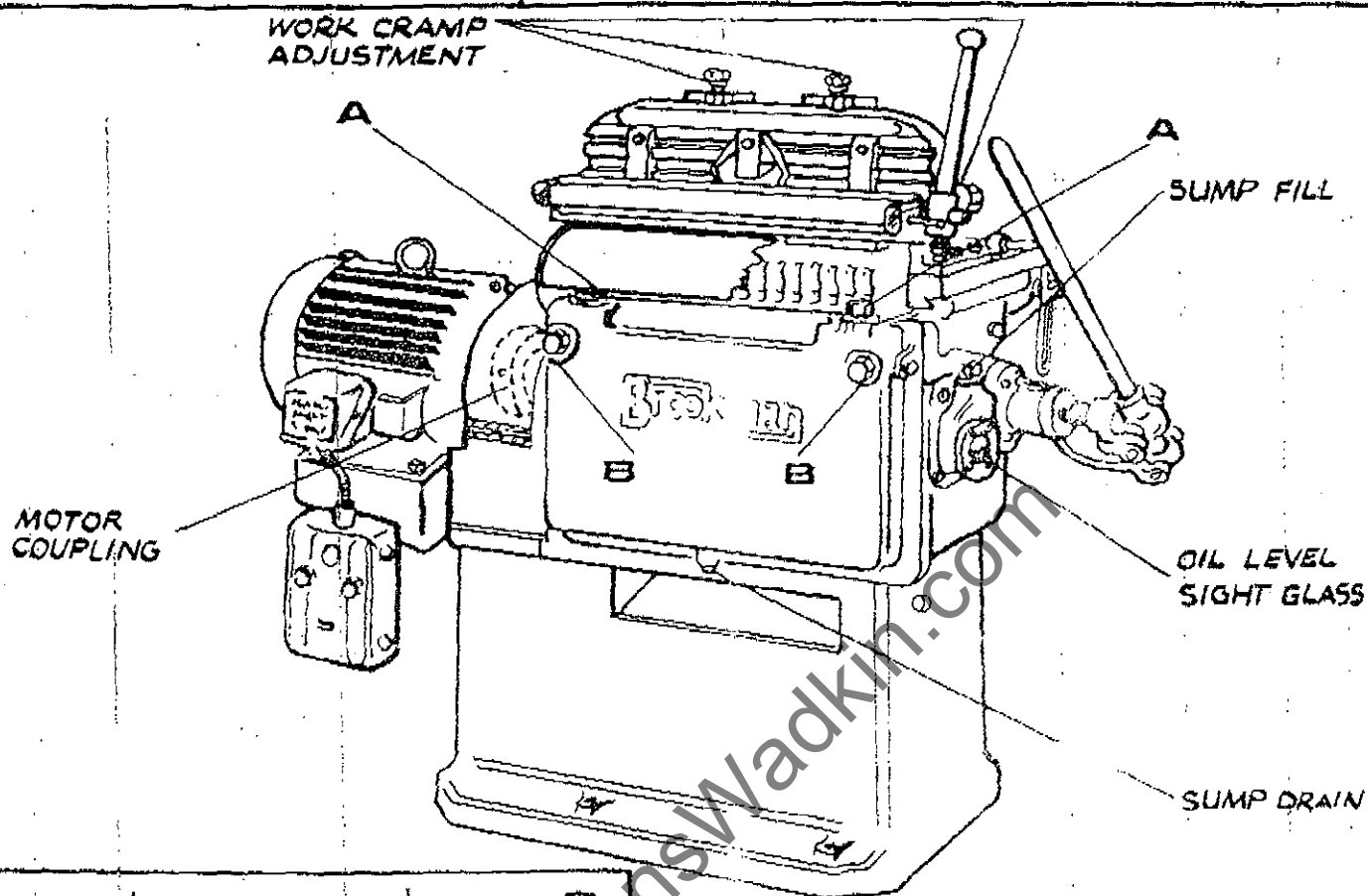
Brookman**15 SPINDLE****DOVETAILER****OPERATING INSTRUCTIONS**

fig 1

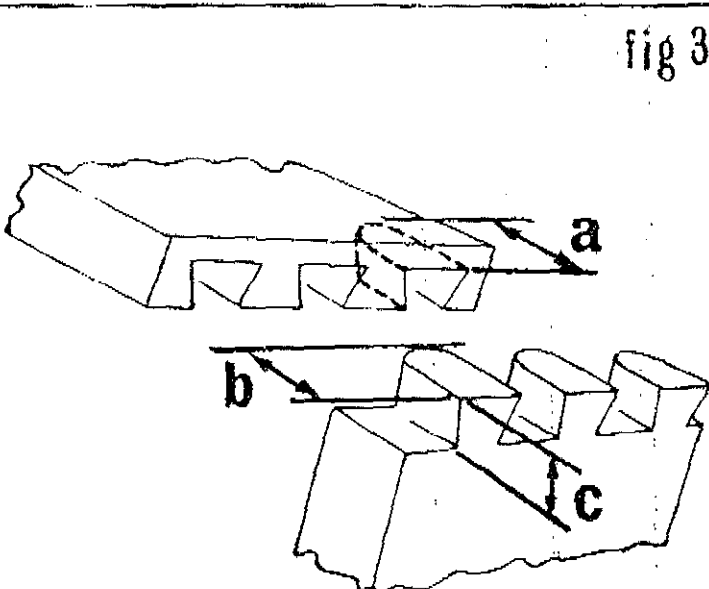


fig 3

OM.2100.2**R. S. BROOKMAN LIMITED . ROTHLEY . LEICESTER LE7 7NS . ENGLAND**

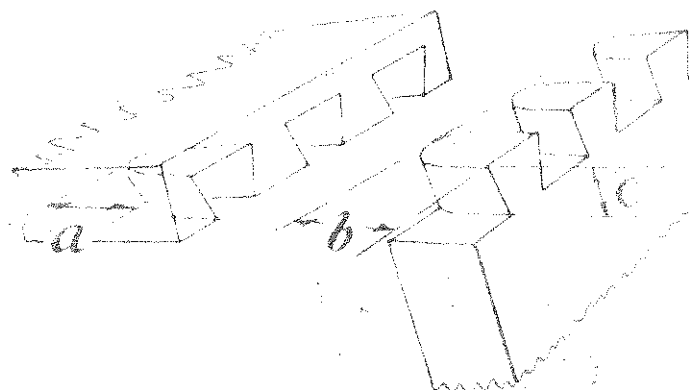
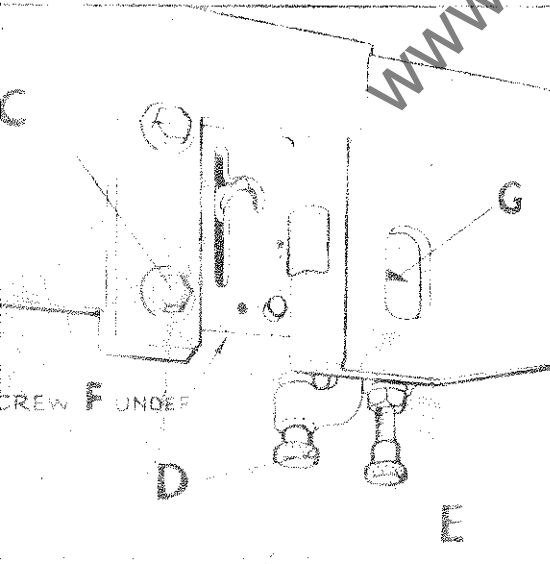
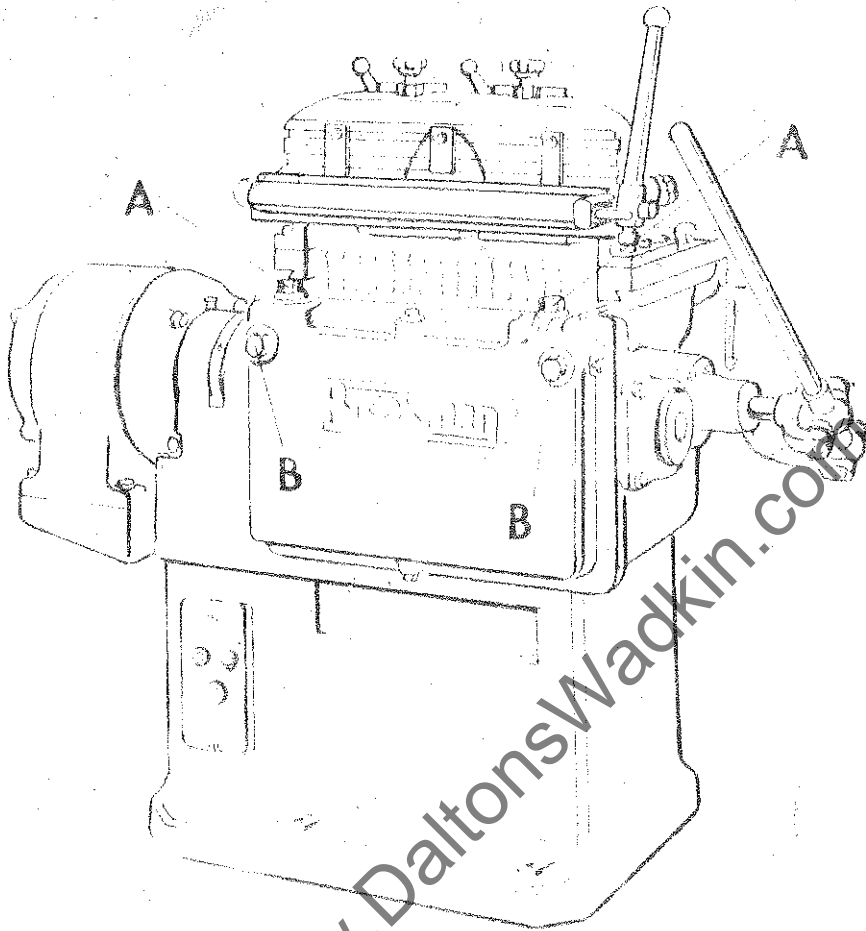
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Brookman

SERIES 2100 DOVETAILER OPERATING INSTRUCTIONS



S. BROOKMAN LTD.

Parkside Works

ROTHLEY

LEICESTERSHIRE ENGLAND

THE "BROCKMAN" LEVER OPERATED DOVETAILING MACHINE.

SERIES 2100

General

The Dovetailer can cut Furniture and Taper Box type dovetails, and also Corner Locking; all of these can be cut in two pitch sizes, $\frac{1}{2}$ " and 1". The majority of machines are supplied with the equipment to enable 1" pitch Furniture type dovetails to be cut, and in such cases the machine will be despatched with the Finger Plate, Former Plate and Former Pin in position. Only the cutters have then to be screwed in and the machine is ready for working. When more than one equipment is available, it will be necessary to fix in position on the machine the above mentioned components appropriate to the size and type of dovetail. The method of fixing is therefore dealt with first, as follows.

Finger Plate

It is much more convenient to fix this when the cutters are removed from the cutter spindles. To identify the plate the size and type are engraved upon it, for example "1" PITCH FURNITURE". Its purpose is to support the wood to be dovetailed. The plate fits into a recess in the front of the work table, under the cramp bridge, and is secured by three screws for the tightening of which a special Weasel Box Spanner is provided.

Former Plate

This is engraved with the same title as is the corresponding Finger Plate. Finger Plate and Former Plate should always be used in the correct pairs. This plate slips into a dovetail slide on the rear of the work table and is locked in position by the two bolts "C". It is connected to its adjusting screw "D" by a knurled headed pin. This pin should be removed to allow the plate to slip in, and then be replaced through the small elongated hole.

Former Pin

The Former Pin is secured in a split bracket extending from the main body of the machine immediately below the Former Plate position. The locking bolt should be released and the pin pushed upwards until the tapered end engages in the slot in the Former Plate. The horizontal spring loaded

pin protruding from the machine should be pushed in and then caused to engage in the groove around the knurled nut on the pin. Rotating the knurled nut will then cause vertical movement of the pin. When adjusted and before operating, the securing screw "F" should always be locked.

Cutters

The Cutters will all rotate in the same direction. They screw right handed in to the spindles. To screw down tight use the tommy bar in the rim of the motor coupling on the main shaft, and the $\frac{3}{8}$ " Gap Spanner on the cutter itself.

The cutters should be kept keen, and care should be exercised when sharpening that all are ground the same amount to ensure that the size is kept constant throughout the set.

Having attended to the foregoing adjustments the machine will be ready for setting up for the exact detail of the particular dovetailing work required.

The position of the operating lever can be adjusted to suit the operator's convenience. For transport the handle is usually turned downwards. Two bolts lock on to the cross shaft, (accessible through the two ports in the rear of the machine body), by releasing these the handle can be moved to the height suiting the operator.

WORK TABLE & CRAMPS.

Work Table

The Work Table is recessed to permit curved components to be dovetailed. A flat location area is provided at the front for regularly shaped work. At the rear of the table is an adjustable cross bar which can be positioned to support the ends of long pieces of wood, be they straight or curved. Should this cross bar not be required and it interferes with the loading of the Work Table, it can be turned to hang below.

Work Fences

Two work fences are provided on each of the table and the bridge. Also a spring fence on the bridge holds narrow work up against the fences whilst cramping. The work fences

must be placed to ensure that the edges of the wood, when dovetailed, will knock together flush. Rule Scales are provided to facilitate the setting; in general, the fences must be set at half a pitch intervals table to bridge. For example on 1" pitch Furniture work if the table fence is set on a half inch mark, say 6", the Bridge fence should be set at the 6" or 7" marks.

When cutting the work must be handed, i.e. if on drawer work either the top or bottom edge, according to preference, must be kept to the fences in all cases.

Cramps

The cramps are the eccentric roller type, and if correctly adjusted will lock down tight. The front vertical cramp has one roller only, and the whole is adjusted from nuts at each end of the bridge. The two rear horizontal cramps cover half the cramping area of the table each. These are adjusted by the indented knobs that project above the cramp bridge.

CUTTING ADJUSTMENTS.

Length of Pin "C"

The term "length of pin" is used to express the amount the cutter projects above the table level, and it affects the dimension "C" in the diagram. To vary: release the screws "B" and turn screws "A" clockwise to increase (higher the cutters) and anticlockwise to decrease (lower the cutters). The cutter spindles are all mounted on a frame which is hanging on the screws "A". It will therefore be drawn up positively, but when lowering it drops under gravity. It may therefore require a little pressure on the tops of the screws "A" when lowering. It is best to lower below the point required and draw up again. The screws "A" have indicator scales so that they can be kept together and eliminate distortion. One complete turn of the screw is 1/16". Re-lock the frame, after adjusting, with screws "B".

Cutting Furniture type Dovetails

The correct finger plate, cutters, former plate and former pin should be fitted as described above, and the cutter height adjusted as required.

In furniture dovetailing the two component parts of the joint are cut together; the cutter is leaving wood that will form the male pin and cutting the female mortice into which the pin will subsequently fit. The drawer sides are placed in the front vertical cramps first and the cramp locked over. The drawer front is placed on the table and butted up behind the side already in position, and cramped.

It will be noted that the former pin and the slots in the former plate are tapered. This is to facilitate the fit of the dovetail. In the first instance the Former pin locking screw "F" should be released and the pin adjusted upwards by the knurled nut until the tapers are reasonably tight, one in the other. The free movement of the table should not be restricted, but side movement eliminated. Lock the Former pin by the Screw "F".

The former plate position in the table can be adjusted by turning the screw D. The plate is locked by screws C.

The rotary dovetail cutters will leave a rounded female mortice, it is therefore necessary to round the male tenon pin to fit this. The furniture former plates provide for this. In order to leave the pin as strong as possible, adjust the position of the former plate so that the drawer side held in the vertical position is just touched by the cutters when the former pin is on the crest of the rounding position of the plate. Having made this adjustment the plate can be locked down by the screws C and it is correctly positioned for any dovetailing in material of the same side thickness.

It is also necessary to limit the forward movement of the table to ensure that the depth of the mortice cut equals the size of the male pin left. In other words dimension "a" must equal dimension "b". Dimension "b" has already been fixed by positioning the former plate. Dimension "a" is determined by the forward movement of the table. This forward movement is set by the stop screw E.

Over the Former plate will be found a scale from which a reading can be taken against the pointer engraved on the plate itself. This reading should be repeated on the scale revealed through the "window" in the table. Release the lock nut on Screw E, and adjust the screw itself to move the Pointer G to the correct reading.

After the foregoing adjustments have been made the Former Plate and the stroke of the table will have been set with reasonable initial accuracy. A specimen joint must be cut to test the settings and if need be final absolute adjustments made in the light of the results obtained and the exact characteristics required of the joint.

The fit adjustment being screwed right up will probably result in a joint that is too tight. This is remedied by releasing the screw F and lowering the former pin by the knurled nut. In order to ensure that the side to side movement that is now possible will be employed the operator must, when traversing the table forward, i.e. wood on to the cutters, keep a pressure towards the motor end of the machine so that the former pin will travel down the straight edge of the groove. When reversing the direction of the cut, also reverse the direction of the pressure, i.e. away from the motor end. Thus will the controlled sideways movement of the table cause a looser fit to the joint to result, and it will also facilitate the rounding of the pin as the pressure is in the right direction.

It must be mentioned that the tightness of fit is also affected by the cutter height. Highering the cutters will tighten the fit and lowering will loosen. Hence, after adjusting for height it will also be necessary to adjust for fit.

Similarly the cutters become smaller with sharpening, owing to the relief, and fit adjustment is again necessary to compensate.

Cutting Secret Type Dovetails

The Secret Dovetail is obtained by the process of cutting the whole of the dovetailing action into each piece of wood. To achieve this the horizontal piece is not butted behind the vertical wood, but is placed alongside so that the forward edge of the horizontal aligns with the outer face of the vertical. The cutting procedure as detailed above is then followed, except that the screw E is adjusted to prevent the cutters passing right through the vertical piece. Other details as to cutter height, former plate position, and fit adjustment remain the same,

The resulting cut is such that the full dovetailing action will be produced on both vertical and horizontal woods

and when knocked together the joint is concealed. To obtain the mitre effect, the work should be suitably moulded prior to dovetailing, and provision made for the mitre portion, resting on the finger plate, lifting the shoulder to be dovetailed above the normal table level.

It is usually advisable to cut Secret Dovetailing separately, the verticals in one batch and the horizontals in another. To gain experience in the use of the machine however, elementary side by side joints should be cut first.

Cutting Box type Dovetails.

Taper Box dovetails are cut in two operations, the end at one setting the sides at another. The procedure is similar irrespective of the pitch size. All the woods are placed in the cramps vertically; the ends being cut by the Parallel cutters (the P series) and with taper movement from the former plate; the sides are cut by the Taper cutters (the T series) and the straight movement from the plate.

The ends should be cut first, and the sequence is as follows:-

Screw the Parallel cutters into the spindles. Fit the Taper former plate into the table and secure by the screws C. Fit the correct former pin and secure by the screw F. Unscrew Screw E to ensure that it does not limit the table movement. Adjust the point of the V on the former plate until the face of the bridge just passes the centre of the cutters. Lay a box side on the table and adjust the cutter height until the top of the cutters and top face of the wood line up. In other words, until the height of the cutters above the table face equals the thickness of the box side. Set the bridge fence so that the dovetails will be cut centrally on the piece of wood. Cramp in an end, and the dovetails can be cut.

To cut the other portion of the dovetail, replace the cutters by the Taper type. Fit the straight movement former plate in to the table. Ensure that the plate is correctly positioned to let the face of the bridge pass the centre of the cutters. Adjust the cutter height to equal the thickness of the end of the box. Ensure that

the taper former pin is up tight to prevent sideways movement of the table. Adjust the bridge fence half a pitch from the previous position. Cramp in the timber and the joint can be cut.

With this set up the tightest joint possible with the cutters used will be cut. If it is too tight it can be slackened by lowering either of the taper former pins slightly, thus giving a sideways movement to the table; or the taper plate can be moved back by the screw D, to bring the wider portion of the V into effect.

It is advisable, especially in the first instance, to set up both cuts and ensure that a satisfactory joint is obtained, before running off a batch.

It is necessary to hand the timbers when cutting. That is either the bottom or top edge must always be kept to the fence.

Cutting Corner Locking.

To cut Corner Locking the C series cutters are used and they cut both ends and sides. The woods must still be handed, and the fences moved a half pitch when changing from ends to sides. The straight movement former plate only is used.

Spelching.

To prevent spelching and breaking out of the grain, timbers of ample thickness should be cramped on the table in the rear cramps to back up the cut. Also the wood and rubber face of the front cramps, secured by wood screws, can be removed; in its place fix $\frac{3}{8}$ " thick timber with the grain vertical, the lowest edge coincident with the table level. When the first cut is taken it will pass through this wood and leave a comb effect to back up succeeding cuts.

MAINTENANCE.

Lubrication.

The brand of oil recommended for the sump is Vactra Heavy Medium, obtainable from the Mobil Oil Co. This brand, or the equivalent marketed by reputable oil blenders should be strictly adhered to.

After a fair run the machine will warm up considerably, this is in no way detrimental and the machine need not stand in consequence.

In the absence of other evidence the oil level should be maintained at the level marked on the gauge. If however the oil tends to seep through the top brass plate, the level can be lowered slightly. So long as there exists the slightest tendency for the oil to seep on to the top plate, there is sufficient oil in the sump, irrespective of the indication on the gauge.

There are several oiling points requiring good quality machine oil from the oil can periodically. For daily attention (yellow discs) four points on work table slides; for weekly attention (green discs) three points on hand lever, fulcrum, two on horizontal cramps, and two on table links (through ports). These points are protected by push in type covers.

A small amount of grease is required to lubricate the former pin movement in the former plate.

Cleaning

Care should be exercised to keep the machine clean; if possible coupling to the dust extracting plant is preferable.

Cutter Sharpening.

Keen correctly sharpened cutters are essential to good finished dovetailing. Great care should be exercised to ensure that the original cutting form of the cutter is maintained with successive sharpening.

Appendix 'A'STANDARD RANGE OF CUTTERS.Furniture Type Cutters.

Cutters must be selected in the appropriate pitch range according to the pitch equipment being used. The following dimensions indicate variation in the "length of pin" dimension "c" which is possible. Cutters cannot be used successfully outside their designed range, either because the cutter head is insufficiently long or the diameter is too great. If a cutter will not produce a tight joint with the Former Pin adjusted to the limit, then the next smaller sized cutter must be used, or the length of pin of the dovetail itself increased.

<u>PITCH SIZE</u>	<u>REF. NO.</u>	<u>LENGTH OF PIN</u>		
		<u>MIN.</u>	<u>NOMINAL</u>	<u>MAX.</u>
1/2"	F.11	3/16"	1/4"	9/32"
1"	F.40	7/32"	5/16"	3/8"
1"	F.41	9/32"	3/8"	7/16"
1"	F.42	13/32"	1/2"	9/16"
1"	F.44	19/32"	5/8"	11/16"

Box Dovetailing and Corner Locking.

The limitations upon the range of thicknesses to which a Box type cutter, and even less so, to which a Corner Locking Cutter, can be applied, are not so confined as with the Furniture type cutters. The main consideration is to select cutters appropriate to the thicknesses to be dovetailed as they will make for easier adjustment for fit, and have longer wearing qualities in the thickness range for which designed.

It is important to remember that the range of thicknesses referred to below is that of the mating board, not the wood actually being cut. For example a box having 1" thick ends and $\frac{3}{4}$ " thick sides, will require 1" long T.42 cutters to cut the sides, and $\frac{3}{4}$ " long P.41 cutters to cut the ends.

PITCH SIZE	TAPER BOX REF. NO.	PARALLEL BOX REF. NO.	C/LOCK REF.NO.	THICKNESS OF MATING BOARD		
				MIN.	NOM.	MAX.
1/2"	T.11	P.11	C.11	1/4"	3/8"	3/8"
1/2"	T.12	P.12	C.12	3/8"	1/2"	1/2"
1"	T.41	P.41	C.41	1/2"	3/4"	3/4"
1"	T.42	P.42	C.42	5/8"	1"	1"
1"	T.43	P.43	C.43	7/8"	1 1/4"	1 1/4"

Appendix 'B'

Procedure for dismantling and re-assembling Spindle Frame for fitting replacement ball bearings to Cutter Spindles.

The cutter spindle ball bearings will require to be replaced after extensive use. Users in the United Kingdom can call upon Brookman Service Engineers to attend and carry out this work. Overseas Users, and Home Users who wish to carry out the replacement themselves, should proceed as follows:-

The spindle frame assembly should be removed from the machine as a unit. To achieve this the sump should first be drained, the top brass plate, through which the cutter spindles protrude, should be removed, and then the cover which bears the "Brookman" name motif.

The lower ball bearings are secured to the spindles by cap screws and washers, and these should be removed. Each spindle in turn is then tapped upwards until the journal portion is clear of the inner races. To achieve this the spindles will be passing through the upper races, and the clearance has been designed to allow this. When all the spindles are clear the lower bearing block assembly can be removed by unscrewing the 15 securing bolts.

The spindles are now tapped downwards back through the upper races until they are clear. As each spindle is removed it is advisable either to mark same, or to lay them down in order, so that they may be reassembled in the same sequence to mate with the same gear from the main drive.

Each of the bearing block assemblies consists of an upper and lower portion which are bolted together with an

$\frac{1}{8}$ " thick separator piece between. This separator piece protrudes on the face side to give location when the whole assembly is bolted together.

The bearing blocks can now be taken apart and the worn ball bearings removed as necessary.

When fitting new ball bearings it is essential to use self aligning types with drilled cages. (Ransome & Marles NLDJ 15 and NLDJ 12 are recommended). When fitting it must be remembered that each bearing has a tolerance to both outer and inner diameters; hence the bearing should be tested in its eventual housing to ensure it has a light tap fit. It should similarly be tried on the spindle and again have a light tap fit. If the fit in either case is slack then the bearing should be tried in a different housing or on a different spindle, and if need be discarded should a satisfactory fit not be possible. In the same way if the bearing has to be driven into position it should be tried on a different mating part. To achieve a satisfactory fit the spindle journal could be honed down slightly and similarly the housing scraped out, but neither of these procedures is recommended otherwise eventually all the bores will be over-sized and all the spindles will be undersize. It is better to select the bearings by careful trial and error.

Having determined the selection of the bearings each is then tapped into position in its own housing and the two bearing blocks are re-assembled. The upper block is bolted back into position on the frame casting and the spindles are then threaded into the ball bearings and tapped up until they are above the normal running position. Note the diameter on which the ball bearing locates is up to full size whereas the diameters either side are made slightly below size so that the spindle will only need to be driven past the point of actual location.

The spindles being now all in position but above their normal locating level the bottom bearing block assembly is bolted into position. The spindles are tapped back, the lower journals entering the lower races. Screw in the cap screws and washers into the bottom end of each spindle and tighten home.

The complete spindle frame assembly can now be returned to the machine.

When the machine has been re-assembled check the level of the spindle tops in relation to the surface of the Work Table. If necessary trim the ends of the spindles to correct.

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