Cam-relief and drillpoint grinding with quick changeover . . . simple operation . . . exceptional accuracy and speed.

Capacity to 2½" for helixpoints, stepdrills and other cam-relief ground tools. Grinds more types of drill points and tools than any other machine.

HARIG

STEPTOOL

RELIEF & DRILL POINT GRINDER

HARIG PRODUCTS, INC.
CONSTRUCTION AND DESIGN

Capacity from #60 thru 1\(\frac{1}{2}\)" with Model S head or from \(\frac{1}{2}\)" thru 2\(\frac{1}{2}\)" with Model L head. With reducing collet sleeve, range extended to include from \(\frac{1}{2}\)" to 2\(\frac{1}{2}\)". L or R hand, straight or taper shank.

- Wheel head swivels 360°
- Table swivels 225°
- Operates wet or dry
- Longitudinal travel, 14". Fast feed — 3\(\frac{1}{4}\)" per revolution
- Slow feed—\(\frac{1}{4}\)" per revolution
- Vertical movement of column—\(\frac{1}{4}\)" x .040 per revolution
- Maximum distance to center of wheel from table—10\(\frac{1}{4}\)"
- Minimum distance to center of wheel from table—3\(\frac{1}{4}\)"
- ELECTRIC: Grinding wheel spindle, 1/2 H.P. One H.P. optional. Headstock 110 volt
- Crossfeed travel 7\(\frac{1}{2}\" x .100 per revolution
- Space occupied: 40" wide x 62" long x 61" high. Weight: 950 lbs.

1 Optical comparator available as optional accessory
2 Infinitely variable spindle speed control
3 Cam adjusting knobs vary clearance angle infinitely
4 Selector for plain cylindrical grinding
5 Handwheel collet closer
6 Cam Headstock swivels 360°
7 Convenient front controls for all movements
8 "Cool" light swivels 360°
9 Infinitely adjustable cam
10 Web-thinning and split-point fixture. Also grinds margins on stepdrills.
11 Timing collar
12 Double crossslide with "stop"
13 Built-in angular dresser
14 Two speed table control for custom or production

NOVEL FEATURES SIMPLIFY OPERATION

Collets are specially designed for gripping flutes — hold tools with minimum overhang. Concentricity in "tenth"s. Rapidly changed.

Infinite cam adjustments to vary clearance angle are made merely by shifting two buttons.

Tools located by grasping with lip, positioner and in-setting into fixture against positive stop.

Web thinning and splitting fixture permits thinning the web, or splitting the point. Will also grind step drill margins rapidly.

No limit to flute numbers including odd numbers. Cam followers adjustable for wear. Change to different number of flutes.
ANGLE DRESSER

$95.00
INCLUDES DIAMOND

HARIG STEPTOOL 5765 HOWARD STREET • CHICAGO 48, ILLINOIS
LOW COST VERSATILE ANGLE DRESSER

The Steptool Angle Dresser is the safest and fastest angle dresser for use in tool and cutter grinding, form tools, cylindrical and surface grinding. The dressing action is obtained by rocking between centers. Abrasive dust is no detriment to the dressing motion since the centers do not admit dust, and have a take-up, to acquire a snug 'feel'. Sticking, jerky or loose, chattering motion is eliminated, resulting in fine micro-finishes. Small and handy, it can hinge down out of way to prevent collision with the grinding wheel. Safe, because operators' hands never get near the grinding wheel. The Steptool Dresser with graduated base also locks in fixed position for dressing horizontally or under the wheel with the slide movements of the machine itself. A sturdy post carrying the diamond nib swivels the point in any direction and raises up and down to match the center-heights of any make of grinder, and permits grinding or sharpening above center while the diamond actually dresses at center. The dresser also lends itself to cam-relief grinding techniques, and it can dress an arc in the wheel for radial relief sharpening. THIS DRESSER WILL SAVE OPERATOR FATIGUE AND EXASPERATION WITH SWINGING THE WHEEL-HEAD BACK AND FORTH TO DRESS ANGLES.

HARIG STEPTOOL
5765 HOWARD STREET
CHICAGO 46, ILLINOIS
NEWCASTLE-1-5050
Harig STEPTOOL WHEEL OF APPLICATIONS

Big Savings through Modern Tool Pointing

WHAT THE MACHINE CAN DO FOR YOU!

Helixpoints
Today tape controlled drilling is steadily increasing. Needless loss of dollars can be saved by self-centering, better hole size, reduced bell mouth, better finish and increased drill life.

Stepdrills
Single or multiple step drills further supersede old fashioned pointing. Multiple hole diameters are produced with a single drill.

Simplifies difficult jobs
Twist drills become so efficient that center drilling and bushings can be eliminated. Two stations can be saved on turret drilling. Improves hole and spacing tolerances.

Split-Crankshaft point
Split pointing and web thinning speeds penetration and reduces pressure of drill. For deep holes and exotic metals.

Sheet Metal and Spur Point
Eliminates burrs and egg shaped holes. One of an endless variety of special points.

Taps
Sharpen on flutes and chamfer. Longer life and faster cutting. Taps normally used once and thrown away can be resharpened at great savings.

Other styles of drill points
Cast iron helixpoint
Modified split point (missile point)
Core drill points
Plastic points
Semi-conventional points
Tough steel point
Non-ferrous point

...PLUS SHARPENING AN ENDLESS VARIETY OF IMPORTANT TOOLS

Gingal flute (uniflute) counter sinks

Core drill points

Multiple stepdrills

Special form and steptools

Combined drill and countersink

Staggered tooth side milling cutters

Key seat cutters

End mills

Shell mills

www.OzarkToolManuals.com
Case Histories

Helixpoint Drill Life

Case History 1.
Part: Hydraulic Sleeve Valve
Material: 52100 Stainless Steel
Machine: 5 Spindle Natco

<table>
<thead>
<tr>
<th>Tools: HSS ( \frac{5}{8} ) dia. chisel points</th>
<th>Present Helixpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeds: 2&quot; per Min.</td>
<td>308 and still sharp</td>
</tr>
<tr>
<td>Speeds: 400 RPM</td>
<td></td>
</tr>
<tr>
<td>Production: 13 per hr.</td>
<td></td>
</tr>
<tr>
<td>Pieces per Sharpening: 26</td>
<td></td>
</tr>
</tbody>
</table>

Helixpoint Drill Life

Case History 2.
Part: Check Valve Cone
Material: 302 Stainless Steel
Machine: Dumore Drill Head, Auto Air-indexing Fixture

<table>
<thead>
<tr>
<th>Tools: 7/32&quot; dia. HSS Chisel Points</th>
<th>Present Helixpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeds: 7.32&quot; per Min.</td>
<td>565 RPM</td>
</tr>
<tr>
<td>Speeds: 60# Air Pressure</td>
<td>565 RPM</td>
</tr>
<tr>
<td>Production: 40</td>
<td></td>
</tr>
<tr>
<td>Pieces per Sharpening: 64</td>
<td>864</td>
</tr>
</tbody>
</table>

Note: Helixpoints drill faster—speeds production—one man runs two machines.

CASE HISTORY NO. 3

Fred Cheleun, manufacturing engineer at DITTO Inc. observing a helixpoint drill entering a rough casting without prior center drilling.

N/C drilling was vastly improved in hole spacing accuracy with the use of helixpoints. Perpendicularity resulted in perfect print size top and bottom.

Chicago Pump Company Div. FMC
Heat-X Corporation
Hagan Chemical Company
New Hampshire Ball Bearing Co.
Ditto, Inc.
Millersburg Reamer Co.
Minneapolis Honeywell Co.
Gould Pumps, Inc.
Illinois Tool Works
Bendix Corp.

General Electric Company
Collins Radio Company
Remmle Engineering Co.
Rocketdyne Div., North American Aviation
Stromberg Carlson Co.
Stanley Tools, Inc.
Western Electric Co.
Waukesha Motors Company

Ronson, Inc.
Consolidated Electro Dynamics
Westinghouse Electric Co.
Cupples Products Corp.
Line-O-Matic, Inc.
Bristol Company
Anderson Electronics
Appleton Electric Co.
Auto-Ponents, Inc.
A. B. Dick Co.
Marsh Instrument Co.

Turner Corp.
Wagner Castings Co.
LaBour Co., Inc.
South Bend Tool & Die Co., Inc.
Dubuque Stamping & Mfg.
Iowa Ordnance Div.
Wee Mite Model Shop
Maryland mfg Co.
A. J. Mitchell Co.
Gage Tool Co., Inc.
Queen Products Div., Tool Specialties Co.

Scratchy finishes, scrapped pieces, incorrect tolerances, all commonly associated with hand grinding or incorrect fixtures are eliminated with STEPTOOL cam-relief grinding. The Steptool grinder is the latest addition to Harig's family of precision machines.

OFFER
Any three drills may be sent to Harig for pointing to your specifications. There will be no charge for this work. Time schedule will be at Harig's discretion. Nominal charge for larger quantities and tests for gang drilling.

HARIG PRODUCTS, INC.
1875 Big Timber Road • Elgin, Illinois 60120 Phone (312) 695-1000
Operator clearly views image of step drill on optical comparator. No need to remove tool for inspection.

The same simple technique is employed on a 2" drill which is pointed with exceptional accuracy on the large capacity headstock.

Grinding a 1/4" step drill to print. Savings can pay for machine in months. Grinding time—

4 MINUTES

Sharpening a 5/16" tap. Seconds of rotation and the tap is sharp and ready to cut. Grinding time—

15 SECONDS

Sharpening a piloted countersink. Cam is adjusted to delicate lift to produce chatterless cutting. Grinding time—

15 SECONDS

ACCESSORIES

Hand Operated Model. For small plants and screw machine shops with a limited number of tools. Economically priced, it can provide substantial savings.

Web Thinning Index Head. Uses interchangeable 5-st collets. Capacity 3/16" thru 1-1/32".

Speed-grip Air Operated Collet Closer. For production sharpening, substantial time can be saved over standard handwheel unit.

Air-Flo Fixture. For sharpening end mills and milling cutters. Floating on a cushion of air it provides "finger sensitive" control with no sticking or jerking while grinding.

2¼" Capacity Headstock. Grind points with unusual accuracy not normally found on large drills.
WHY A FLOOR MODEL DRILL AND RELIEF GRINDER?

HARIG STEPTOOL RELIEF AND DRILL POINT GRINDER, RANGE: 1/16" THROUGH 1-1/2".

Most plants today purchase machine tools for savings and efficiency in production, but one of the most overlooked and hidden costs in metalworking plants is the inefficient and improper maintenance of cutting tools.

Old-fashioned methods of grinding and sharpening cutting tools result in the needless loss of thousands of dollars a year. A "Booted" grind by hand or by inefficient equipment can cause ruined parts and exasperation to the machine operators and their lead men. Conversely, a precision sharpened tool or twist drill with the proper point and clearance angle for the specific material and job application will result in great savings through accurate, properly spaced, smooth and burr-free holes.

The HARIG STEPTOOL RELIEF AND DRILL POINT GRINDER exists and was developed for the efficient and precise resharpennng and original grinding of twist drill points, taps, stepdrills, countersinks, deburring cutters, endmills, reamers, and a myriad of other special and basic tools ordinarily used in production. Years of experience and understanding of the operator's needs have led to the design features which make it possible for an unskilled operator to grind the tools with ease and simplicity.

This machine, placed near the tool crib or tool grinding department and available for immediate tool sharpening or alteration, accounts for tremendous savings in trouble and money and wasted down-time.

The HARIG STEPTOOL RELIEF AND DRILL POINT GRINDER is extremely low priced for its enormous versatility, and it confines to one machine the many operations that heretofore had to be done on expensive tool and cutter grinders or specialized machines.

**TYPES OF TOOLS QUICKLY GROUND AND RESHARPENED**

**Twist Drills**
- Spiral Point (Heli-point)
- Conventional Point
- Modified Split Point
- Web Thinning
- Sheet Metal Point
- Missile Point
- Printed Circuit Point
- Core Drills

**Taps**
- 3 or 4 flute
- Stepdrills

**Countersinks and Deburring Cutters**
- Unflute Countersinks
- Combination Drill and Countersink
- Pilot Tools

**Reamers and Stepreamers**
- Valve Seating Tools
- Boring Tools
- Multiple Step Tools

**Endmills**
- Mill Cutters

**Stagger, Plain and Shell**

* Machines performing only this operation exist which are more costly than the HARIG Steptool Shapemaster!

**CONCERNING DRILL-POINTING, ETC.**

Range: Range of diameters of drills, etc., that can be ground is 1/64 through 1-1/32" inclusive. Up to 2-1/2" with large headstock.

Colleting: 5-ST Collets, 1/64" collapsibility, 4 split, extra deep, designed for gripping directly on flutes. Set of 5-ST Collets optional with any Model consists of 66 Collets, sizes 1/64" through 1-1/16" inclusive by 64th increments. Air action collet closer and pull piece for rapid collecting. 8-ST Collets for large headstock.

Variety of Twist Drills which may be Shapemastered: Straight or tapered shank, right or left, 3 or 4 flute core drill, fast, normal or slow spiral.

Flexibility of Point Configuration: Infinite variety of point angles, cutting angles, styles of point: Helixpoint (Spiral Point) to 1/2°; Conventional Point (Chisel Point, Flat); Semi-Conventional Point (Slant Crown); Split Point (Crankshaft Point); General Purpose Point; Non-Ferrous Point; Sheet Metal Point; Trepan Point (Spur Point).

Model 102C.

The ultimate for modern tool grinding. Equipped with optical comparator, built-in wheel dressing, integral slides and fixture for web-thinning and splitting. Capable of sharpening virtually every known cutting tool.

Model 102.

Same as 102C, but without comparator.

Model 101.

Same as model 102, but less features pertaining to web-thinning and splitting.

Model 101E.

Standard machine with sensitive ball bearing table and air-flo fixture for straight or tapered end mills and milling cutters. Ball nose end mill sharpening arrangement available.

Model 101L.

Same as 101, but with capacity from 1/4" thru 2 1/4", with reducing collet sleeve, range extended to include from 1/4" to 2 1/4", L or R hand, straight or taper shank.