Kuzma RD Kit for ultrasonic record cleaning

(ULTRASONIC CLEANER BATH IS NOT SUPPLIED WITH KIT)

INSTRUCTION MANUAL FOR RD KIT.

2015-03

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General introduction:
Ultrasonic cleaning is used in industry for cleaning the most precise and delicate parts such as bearings for the aerospace industry or gold and silver jewellery. Ultrasonic high frequency waves (40 kHz) are transmitted through water creating a process called cavitation. This creates microscopically small bubbles between the surface of the submerged parts and any small particles on surfaces, such as dirt. These bubbles burst and push the dirt away from surfaces. When cleaning metal or plastic the process must be optimised to avoid damage to surfaces. To do this it is necessary to control power, temperature and the time of the cleaning process.
This is how all dirt in the grooves of records, even in new pressings is removed. Sonic results are beyond expectations!

To bring the **ultrasonic cleaning process to every record collector** we decided to make the RD kit's (rotating and drying kit) purchase price as low as possible, thus enabling the customer to purchase the ultrasonic cleaner bath locally (using our guidlines).

The Rotating and Drying record rack kit (RD kit) will allow you to submerge records in the ultrasonic cleaning bath and position them in a suitable drying position.
It will allow you to clean 10 LPs in one hour by the ultrasonic process, giving you the cleanest records ever, free of static charge.

Brief description of the ultrasonic cleaning process:
Records are positioned on the spindle with spacers on the stand and then submerged into the ultrasonic cleaner warm bath for a limited time. The liquid is distilled water with a few drops of isoproply alcohol and wetting agent added. The spindle rotates with the records, powered by a small motor while dipped into the liquid just below the record labels. The records rotate with 0.4-0.6 rpm (less then one revolution per minute).

If by any chance the record label gets wet no harm is done.
After ultrasonic cleaning the spindle with records is lifted out and positioned on the stand to air dry. When dry, any particles on the record surface are brushed with a carbon fibre brush (records have no static electrical charge) and the records are inserted if you wish into new sleeves.

Description of RD kit: (kit does not include ultrasonic cleaner bath)
The RD kit compromises frame with motor , supporting legs, spindle for holding records, record spacers, a clamp for fixing records on the spindle and a stand for drying records. In the kit small starter bottles of isoproply alcohol and wetting agent are also included as well as a carbon fibre cleaning brush and DC power supply for motor. Kit assembly requires only 10-15 minutes and a meduim size Philips screwdriver.

RD kit (rotating and drying)

8 pcs extension legs included

RD kit:

1x main frame with motor (DC 9V with provided mains adaptor)
1x spindle (record holder)
1x drying stand
1x clamp (grip lock)
8x extension legs(40 mm- for higher size cleaners)
10x PVC spacers
1x record carbon brush
1x PVC bottle wetting liquid- as for photography (for 5 bath fillings)
1x PVC bottle isopropyl alcohol (for 2 bath fillings)
1x instruction manual
2x Allen keys for leg and rods fixing (3mm, 2,5 mm)
2x Allen keys for spindle positioners adjustment (2 mm, 1,5 mm)

To start cleaning your records you need to purchase :

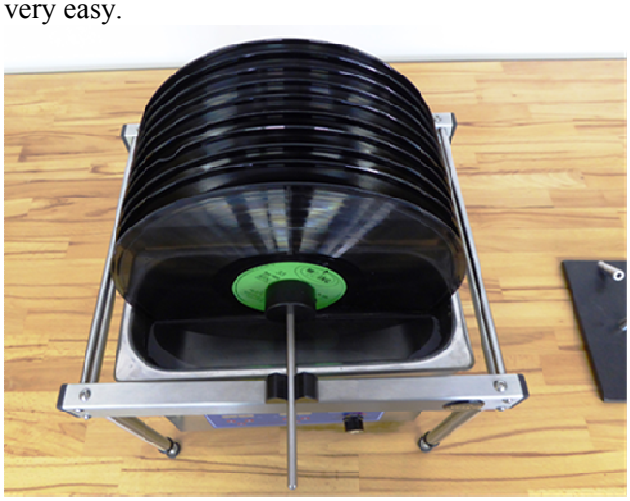
1x ultrasonic cleaner bath
10 liters distilled water(for one filling: 300-400 LPs)

Ultrasonic cleaner bath- typical sample

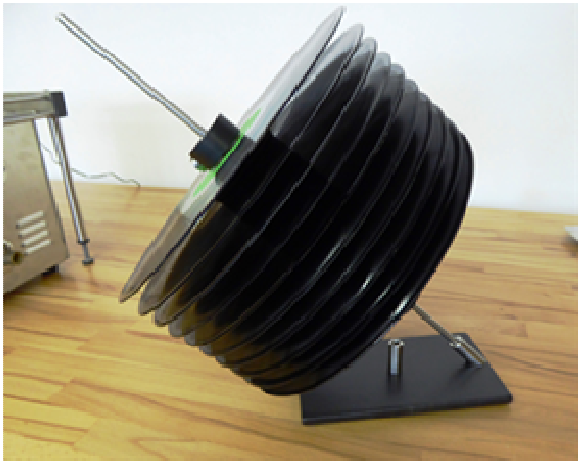
The main frame is positioned around the ultrasonic cleaner bath. Records are placed with spacers on the spindle fitted on the stand. The spindle holding the records is then positioned on top of the frame where the motor slowly rotates them in the bath.

Frame is positioned over ultrasonic (US) cleaner bath

US cleaner must have time, temperature and ultrasonic power control. After aprox 10-15 minutes the spindle with the records is lifted from the bath and positioned back onto the stand to air dry records. Once records are dry , the top surface of the record is swept with the carbon brush to get rid of any possible dust particles and the records put in new record sleeves. As the records are free of static charge, this process is very easy.



Spindle with records on frame in ultrasonic bath



Spindle with records in drying position

Technical requirements for ultrasonic cleaner bath:

There are various ultrasonic cleners on the market. Simply look into the technical data and if they meet the following criteria it will clean safely.

Bath inner size:	min 297 x 220 x 135	(mm: Lenght x Width x Depth)
	max 305 x 240 x 150	(mm: L x W x D)
Cleaner outer size:	min 325 x 265 x 270	(mm: Lenght x Width x Height)
	Max 365 x 278 x 395	(mm: L x W x H)
	(special size frame can be made on request)	
Volume:	min 8-10 lit	(depends on the bath size)
Ultrasonic frequency:	35-40 kHz	
Temperature control:	min 20-50 Celsius range	(suggested temperature is 30-33 C degrees)
Timer:	min 5-20 minutes range	(suggested cleaning time is 10-15 minutes)
Power control:	0-100%	(suggested cleaning power is 50-60 % of full power)

In case of doubt ask your dealer or us directly, sending us technical details about cleaner.

Ultrasonic record cleaning process with RD kit

Ultrasonic Bath:

Purchase an ultrasonic cleaner bath (to our technical requirements) following our instructions and familiarise yourself with the instruction manual. Find adequate space and a surface, which is not sensitive to moisture, with good light and a mains outlet. Purchase at least 10 liters of distilled water.
Position the ultrasonic cleaning bath on a solid flat surface. Level horizontally if necessary.
For more information how to prepare the liquid go to page 12. Once you get familiar with cleaning process everything will be really simple.

RD kit assembling and preparation:

Locate the various RD kit parts. See Fig.1.0. The only tool which is not provided in kit the for assembling is medium size Philips screw driver. You need to assemble the frame and stand.

Fig.1.0. RD kit- various parts

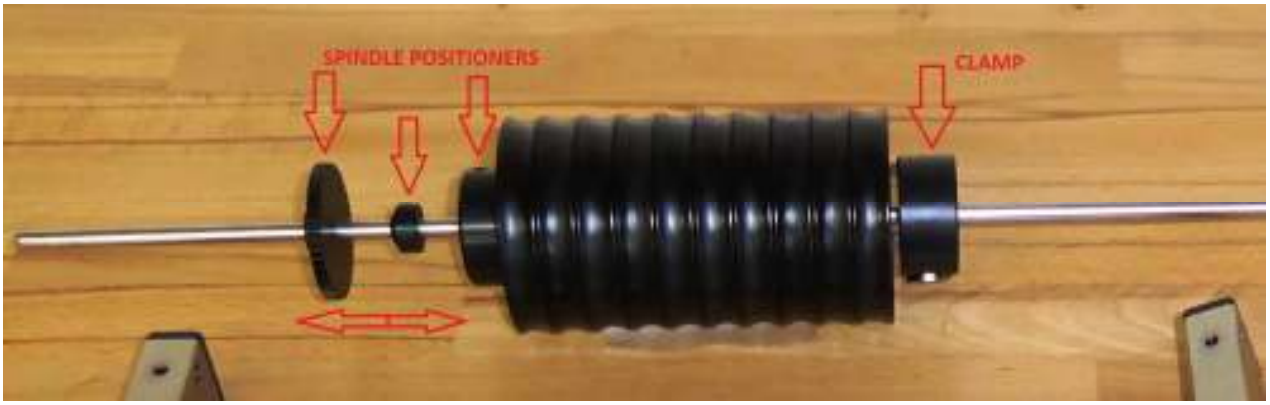


Fig. 1.1. Spindle with 10x spacers & clamp (you might need readjust spindle positioners-see page 12)

Fig. 1.2. Stand

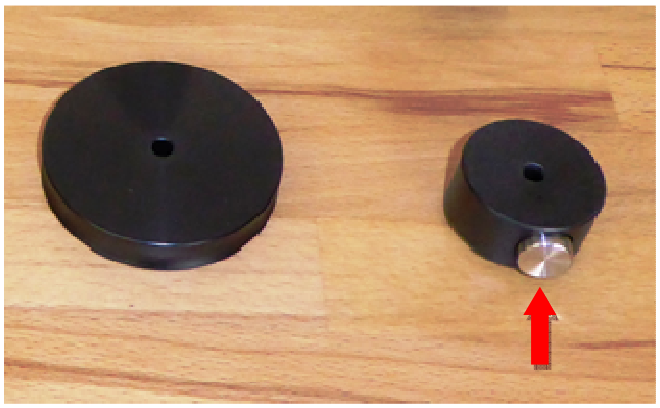


Fig. 1.3. Spacer, clamp

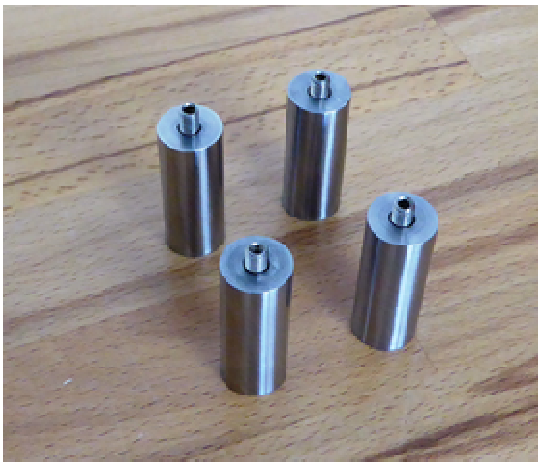


Fig. 1.4. Extension legs

Frame assembly: Fig. 2.0.

The frame consists of two square stainless steel tubes fitted together with 4 thin stainless steel rods and screws. Fig. 2.0- 2.8.

Fit rods in the larger holes on one side of the square tube and fix screws in the opposite side in the smaller holes with allen key 2,5 mm.

Fig. 2.0. Parts for frame assembly

Fig. 2.1. Frame parts: 2 square tubes with 4 rods

Fig. 2.2. Fixing rod into square tube

Fig. 2.3. Frame with 4 rods nearly assembled

Then fit the other end of rods into the second square tube which has a black PVC ring fitted with two screws on the same side as motor assembly. Secure all 8 screws with moderate force.

Hold the frame in a vertical position and fit one leg using the long large screw and Allen key 3mm. The screw comes from the side where there are two black bearing blocks. Fit remaining three legs. Fig. 2.4-2.8.

Fig. 2.4. Frame with 4 legs

Fig. 2.5. Fixing leg into frame with allen key 3mm

Fig. 2.6. Legs with extension legs

Fig. 2.7. Min and max leg's height


Fig. 2.8. Legs assembled on frame

Frame height: Fig. 2.7.
Depending on the height of the ultrasonic cleaner, add or remove extension legs to the chart below. Simply screw them on the top as per Fig. 2.7. Measure height of cleaner from support to the top edge of the bath.

Cleaner height: 265-315 mm leg 250 mm (remove one extension leg)
305-355 mm leg + 1 extension leg (total length 290 mm)
345-395 mm leg + 2 extension leg (total length 330 mm)

Fine adjust height with feet height adjustment.

Mount motor: Fig. 3.0.
For assembling the motor you will need a medium size Philips screwdrive (not supplied) using two two screws already in position on the square tube. Motor housing should be positioned on the outside of the frame. Fig. 3.0-3.3.


Fig. 3.0. Frame with motor ready for mounting

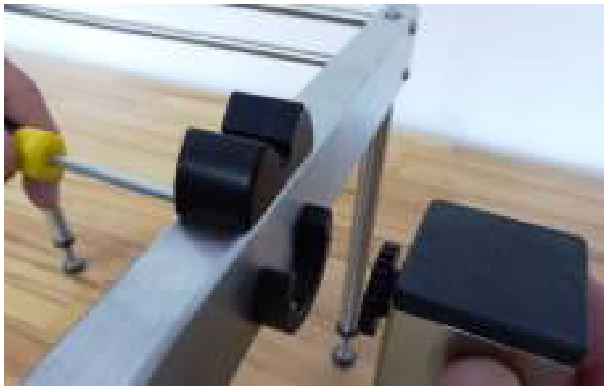


Fig. 3.1. Fix motor on frame

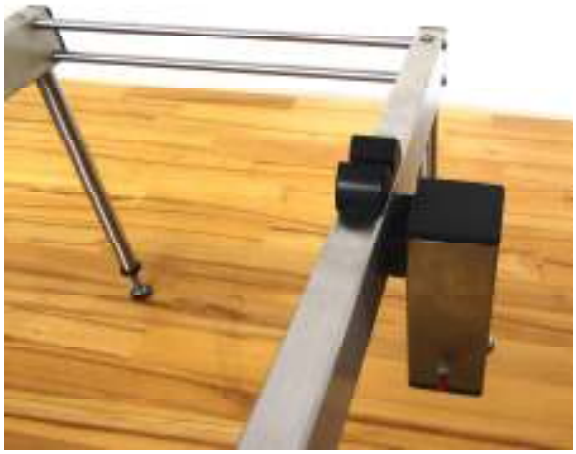


Fig. 3.2. Motor assembled

Fig. 3.3. Frame assembled

Frame positioning: Fig. 4.0.

Position the main frame over the US cleaner bath in such a way that the motor housing with the switch is at the back. Be sure that in the process of buying US cleaner the outer size and bath has suggested inner size. Otherwise the main frame might not fit around the bath.

Fig. 4.0. Frame over US bath

Fig. 4.1. Rear of the frame- motor with switch

Adjust the height of supporting legs to reach suggested height (50 mm available range) Fig.4.2.. If not high enough you add extension legs or even ask for different length legs. Between the top edge of frame to the top edge of bath there should be a height difference of appproximatelly 25- 28 mm. See Fig. 4.4. Fine level frame to avoid wobbling by readjusting leg height and secure it with black nut.

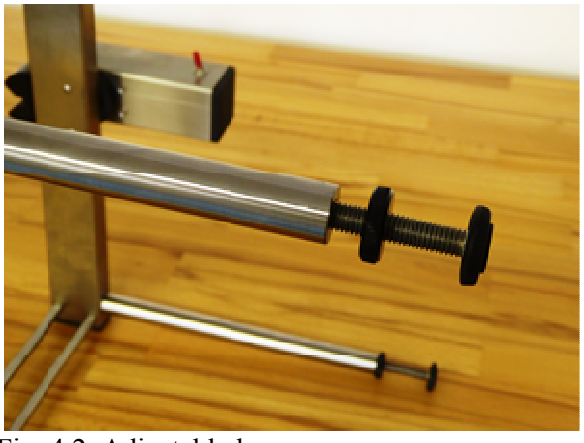


Fig. 4.2. Adjustable legs

Fig.4.3. Level frame with US cleaner bath

Fig. 4.4. Frame & bath-side view-observe height

Fig. 4.5. Frame & bath- top view

Connecting motor and spindle position: Fig. 5.0.

Plug in DC voltage adaptor at the back of motor housing, plug into mains and switch on motor. Fit over the frame spindle in a such way that the black tooth wheel is on the top of the tooth wheel in the motor housing. You should notice slow rotation and hear a little rattling noise.

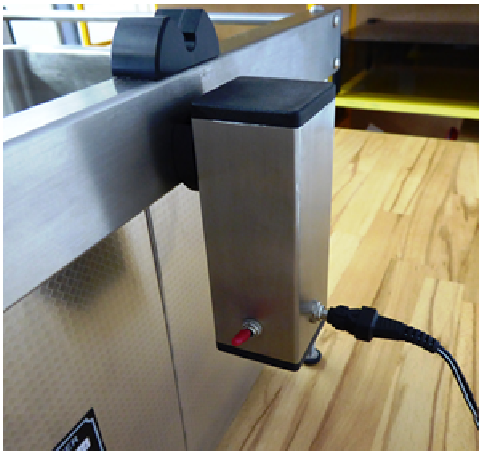


Fig. 5.0. Motor, switch, plug in DC supply

Fig. 5.1. Spindle in the rotating position

Spindle positions: Fig. 6.0.

Position the heavy black metal stand about 0.5m away from the frame. Insert spindle in the central vertical position of the bush. This is the position for fitting or removing records. Fig. 6.0.- 6.1.

The tilt position is the drying position. See Fig. 10.2.

Fig. 6.0. Spindle in the stand-vertical

Fig. 6.1. Spindle with first spacer

Record fitting on the spindle: Fig. 7.0.

For the first time put on a single LP and fit it over the frame to check height and position of the frame over US bath. Check record position in the bath and if need it reposition large spindle positioner along the spindle shaft by releasing hex screw with Allen key 2 mm to suit your size bath.

Find a few old records which are not important to have a first test of the ultrasonic cleaning process!

Fit 10 LPs (start with only few and check bath width) on the spindle using black spacers and finally fix records down with the clamp. Press and hold button and push it down the spindle with soft tips towards the records.

Fig. 7.0. One LP on spindle

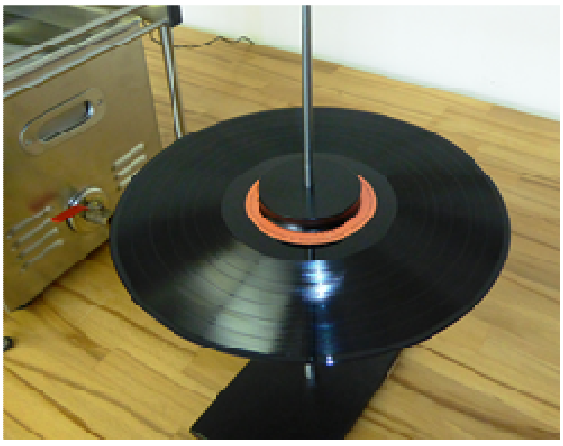


Fig. 7.1. Spacer on top of LP

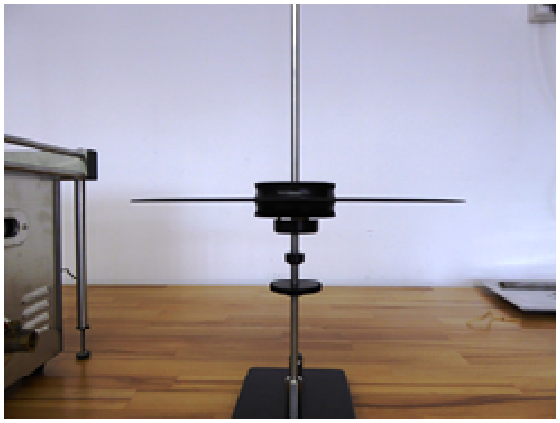


Fig. 7.2. Spindle with one LP- side view

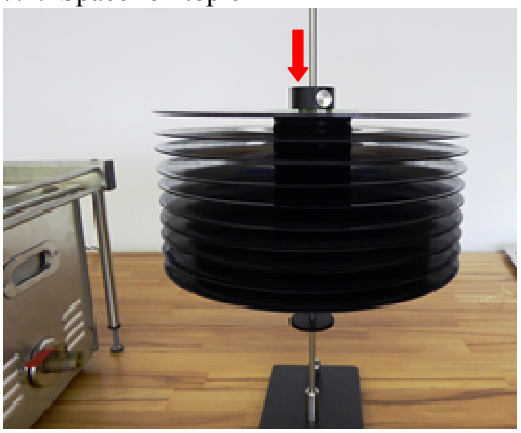


Fig. 7.3. Spindle fully loaded with 10LPs

US cleaner bath filling: Fig.8.0.
For the first time read bath preparation on page 5 again. Plug in mains connector to US bath after you fill in liquid. **As you know you should NOT switch on ultrasonics without water in the bath!**

Preparation of liquid:
Pour distilled water into bath to about 50 mm below the top edge. It will be topped up later. Add 100 ml isopropy alcohol and 10-15 drops of wetting liquid (agent). Precise quantities are not important.

Switch on ultrasonic cleaning for 15 minutes and set temperature at 30 deg Celsious (C). This will prepare and mix liquid and more important minimise air bubbles in the liquid itself for maximum cleaning effect.
Add or remove some liquid to get desired level of liquid. Fig. 8.0.

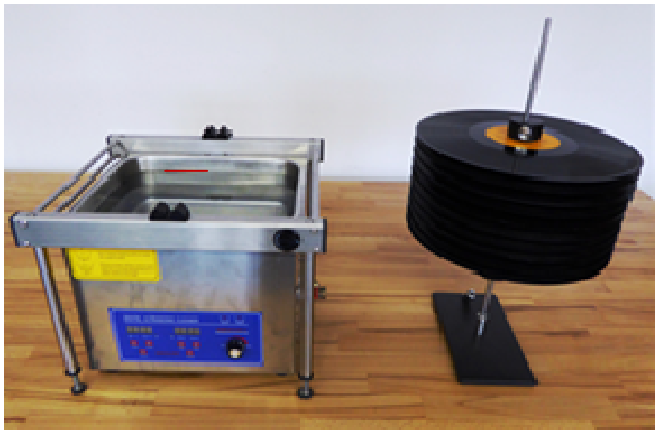


Fig. 8.0. US cleaner bath with water

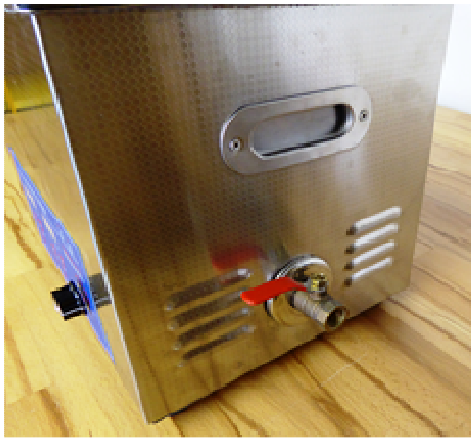


Fig. 8.1. Drain tap in closed position

Power adjustment:
Full power will create big ripples on the surface- this will mix water and minimise air bubbles.
At some point reduce power for a short time so that only small ripples are visible. Mark that position! This is the working US cleaning power for record cleaning. With more records in the bath you might increase the power a little . It is important that you keep the power level in this range but a bit more will be just fine.

Working conditions:
Temperature: 30-33 deg C (you can experiment up to 40 deg C)
Time: 15 minutes (but it is not critical if less)
Power: adjust it till ripples are very small on top surface (about 50-70 % of full power)

Spindle positioning on frame over bath: Fig. 9.0.
We suggest that for first time you use only few old unimportant records to familiarise yourself with the cleaning process.
Carefully lower the spindle with records onto the frame. Observe the records height and water level (around 25 mm the top edge of the bath). Observe the edges of bath to fit records in it. Position spindle with tooth wheel on top of motor tooth wheel. Spindle should neatly sit in the two bearing support. Fig. 9.2. With some cleaners you might need to reposition spindle positioners by using allen keys- **see Fig. 1.1 &9.5.**
Water level should be below record labels. But when more records are submerged the water level will rise a little. Adjust water level accordingly by adding more water or removing it . Also try readjusting the frame height. Adjust liquid to raise 5-10 mm below record label. With use check liquid level and add some water if need it.

Fig. 9.0. Holding spindle with LPs

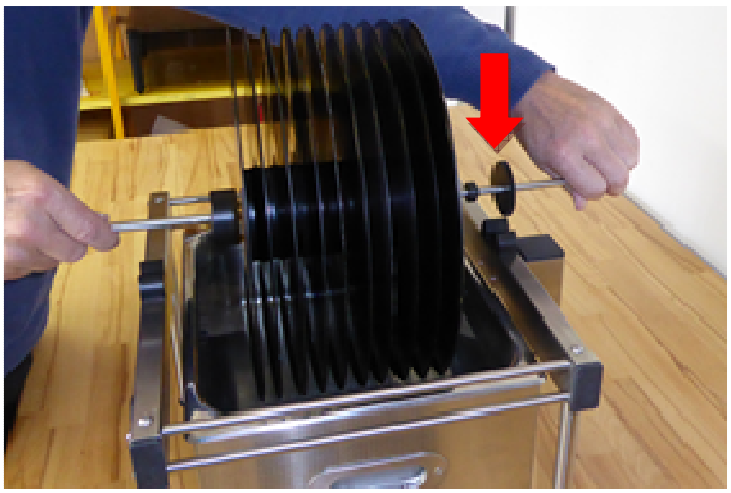


Fig. 9.1. Lowering spindle in the rotation position

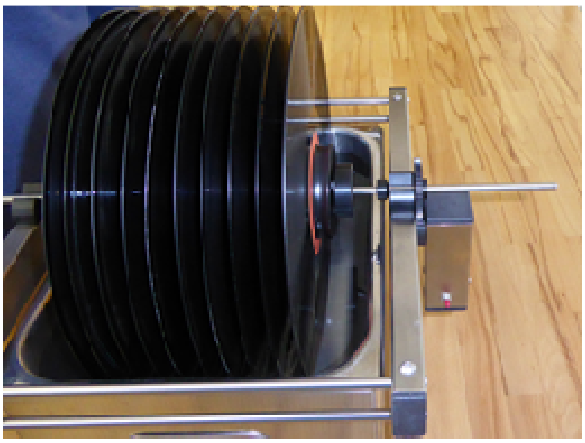


Fig. 9.2. Spindle position in bath- side view 1

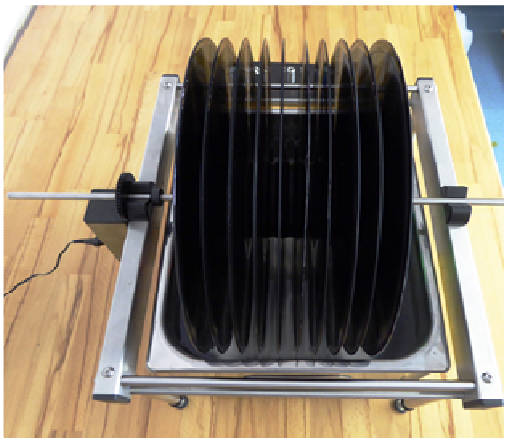


Fig. 9.3. Spindle position – side view 2

When you are satisfied switch on rotation and ensure records rotate. The water level should be below the black spacers or labels. If necessary retighten records by pushing the clamp towards the records.

When you switch on the ultrasonic power and you may notice bubbles forming inside the bath or on the record surfaces. The cleaner the record, the less bubbles will be seen. Do not forget that the main aim is cleaning inside the record grooves and these bubbles are NOT visible. You will see your records shinier then ever after the cleaning process.

If the water wets the labels- do not worry as it will dry up without any damage.

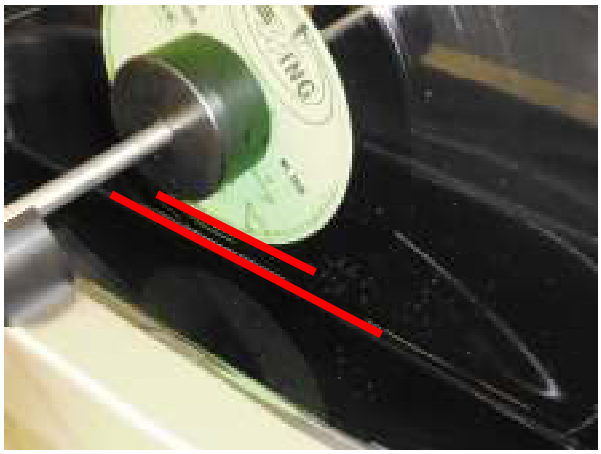


Fig. 9.4. Water level below record label.

Fig. 9.5. Gap between edge of bath and LPs

Spindle lifting and positioning in drying position: Fig.10.0.
When the time is nearly finshed very slowly lift up the spindle with records and gently shake it. Position spindle with records in tilted hole- keeping the wetter part of the records in the lower position.
Less water is stuck on record surfaces if the ultrasonic is still working while lifting records out of the bath.*
Of course you can also lift records out of the bath after ultrasonic is turned off. Drying takes about 30-40 minutes. You can shake the spindle.


Fig. 10.0. Lifting spindle with LPs out of bath.

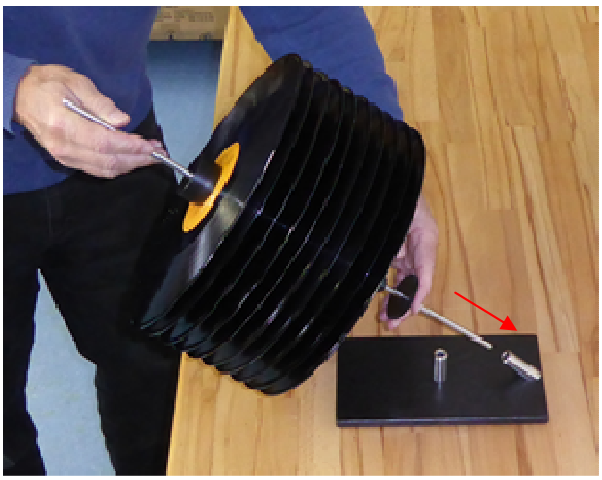


Fig. 10.1. Inserting spindle in the stand

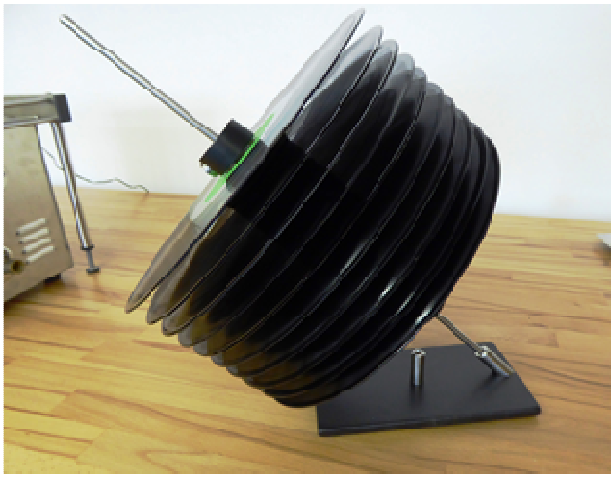


Fig. 10.2. Spindle with records drying in the stand

Record wiping and storing: Fig. 11.0.
When records are dry (check after 40-60 min.), position spindle back in the vertical position on the stand and you are now ready to put your clean records back in the sleeves.

Fig. 11.0. Spindle with LPs in vertical position

Fig. 11.1. Wiping LPs with carbon brush

During the cleaning process small particles of dust collect in the bath or may have fallen from your clothes so when the records are dry you might see some of these particles on top of the record surface.
Removing particles from the record surface with a carbon fibre brush is very easy due to the lack of static electricity.
Some other US cleaners dry records quicker but this makes records statically charged again.

Remove the clamp by pressing the button and with fingers of one hand hold outer record edge, push down label and rotate record. With second hand hold brush and remove particles. Use good light. Fig. 11.1.
Lift up record, flip it over and repeat cleaning of the second side. Then insert clean record into clean sleeves.
Remove all remaining records one at a time in the same way.

Finishing cleaning:
When not in use cover bath with a lid. If you are not planning to use it for more then 8 hours we suggest you switch off the bath.

Increasing production:
If you would like to clean more records in one session you should purchase a spare spindle with spacers and stand. Two extra sets will allow you to clean 30 records in 60-70 minutes. You need to purchase spare stand with spindle: Fig. 1.1& 1.2. To speed up drying process use slow blowing fan.

Notes:

-After you clean a few records you will get used to the process and you will find it very easy to use.
-You may notice a fine black powder in the water. Due to the nature of the cleaning process this will not get in the grooves. We suggest you clean 300-400 records before replacing liquid.
- If your records are very dirty then the liquid will collect dirt . We suggest you clean very dirty records first with vacuum cleaning or clean very dirty records just before you are planning to replace water with new.
-You might observe that records will bend when submerged in warm liquid (over 35 deg C) but they will flatten after a few revolution in bath.
-* If you have time leave records rotating in bath after the ultrasonic wash for additional 15 minutes. In this way the least particles will stay on top surface of the record.

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